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TAXONOMY AND HOST SPECIFICITY OF NEARCTIC ALLOXYSTINAE WITH A CATALOG OF THE WORLD SPECIES (HYMENOPTERA:CYNIPIDAE)

By

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INTRODUCTION

The Alloxystinae are a widely distributed group of small wasps that are internal parasites of primary aphid parasites, the Aphidiidae and Aphelinidae. Their small size and cryptic habit has led to their absence or paucity in most collections. Their similarity of form and wide distribution, coupled with the loss of type material, has resulted in confusion taxonomically at both the generic and specific levels. Morphologically, they are very similar to other cynipid subfamilies and, like the other subfamilies, have been defined primarily by their host associations. Host specificity is not narrowly defined and apparently is based on a complex interaction between the hyperparasite and its plant, aphid and primary parasite hosts.

In this paper, the limits of the subfamily Alloxystinae and its genera are redefined, the nearctic species are revised, the species of the world are cataloged and biological associations that are known are discussed.

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HISTORICAL REVIEW

The first Alloxystinae described was *Allotria victrix* by W. O. Westwood (1833). The association of name with organism was not immediately recognized and Zetterstedt (1838) named two species in *Cynips* and Hartig (1840, 1841) described the genus *Xystus* and included 25 continental European species. In 1843, Hartig recognized that *Xystus* and *Allotria* were synonyms and that *Allotria* had priority. In the following 25 years, several authors described species in *Allotria*. The most significant work was the description of 14 Swedish species by Thomson (1862).

The first critical review of higher categories in the group was made by Foerster (1869) when he recognized seven genera: *Phaenoglyphis, Hemicrisis, Pezophycta, Nephycta, Allotria, Dilyta,* and *Alloxysta.* Foerster's classification was basically followed by Cameron (1879, 1887, 1890) in his works on the species of Scotland and England, by Kieffer (1904), and Dalla Torre and Kieffer (1910) in reviews of European and world species, and by Ashmead (1903) and Weld (1952) in discussions of the North American species.

Kieffer's monograph of the world species in Das Tierrich (Dalla Torre and Kieffer, 1910) brought the world literature and species together for the first time. The weakness of this work resulted from Kieffer's inability to see other workers' types. His keys were constructed largely from the literature and, in many cases, were not diagnostic enough to separate the various species. His concept of *Dilyta* Foerster, 1869, was that it was synonymous with *Alloxysta* (sensu stricto). He considered Thomson's genus *Glyptoxysta* (1877) a second subgenus with *Alloxysta.* Hellen (1958) made a careful analysis of Foerster's (1869) description of *Dilyta* (the type or type series is unknown) and decided that *Dilyta* and *Glyptoxysta* were congeneric, with *Dilyta* the senior synonym. He also decided that *Charips* (Marshall, 1870) was congeneric with *Dilyta.**

In 1909, Kieffer discovered that the names *Allotria* and *Xystus* were preoccupied and that the oldest available name was *Charips* Marshall, 1870. In the following year, Dalla Torre and Kieffer established the subfamily name Charipinae. The removal of *Charips* from the subfamily

* *Dilyta* is removed from the Alloxystinae and moved to a new subfamily (Andrews, in press)

means Alloxystinae (Hellen, 1931) must become the correct name.

Hellen (1963) placed the short-winged species in *Nephycta* and *Pezophycta* of Europe in synonymy with *Alloxysta*.

In 1909, Kieffer described a very distinct genus (*Lytoxysta*) from the eastern U. S.

Alloxystinae presently includes the following genera:

Phaenoglyphis Foerster, 1869
Alloxysta Foerster, 1869
Hemicrisis Foerster, 1869
Lytoxysta Kieffer, 1909

METHODS AND MATERIALS

Collection and acquisition of specimens—The systematist receives support from museums in the form of specimens, particularly of the common and widespread species. This is not the case with Alloxystinae; most museums have no specimens or do not have series or host association data.

Specimens from economic entomologists who were involved in aphid-oriented projects were particularly valuable, as there were long series with the sexes associated and the hosts noted. The majority of the specimens used in this study were collected by various members of these aphid parasite projects.

Collection methods fall into four categories:

Sight collection involves searching of vegetation and net collecting or aspirating the insects when located. It was most profitable near aphid infestations on plants where Alloxystinae could be seen walking over and around aphid colonies. On several occasions, specimens were taken at flower heads where they were apparently feeding. Sight collecting was the least productive method, largely because the small size of the insects makes them difficult to see.

A second method was sweeping. This technique on occasion produced fair numbers of specimens; it was usually not possible to associate them, even indirectly, with hosts.

A third method, malaise net trapping, has potential in the development of species lists for an area and phenologies for specific species. The trap should be run from early in the spring before the first Alloxystinae appears until they disappear when hot weather drives host aphid populations into estivation. Ideally, the traps should be serviced daily. On some occasions, traps were allowed to go longer between changes if the catch did not overflow the trap. This method also does not allow the association of the hyperparasite with hosts or the opposite sex. It did, in theory, collect both sexes of all species in an immediate area. Use as a density indicator was probably possible, but at the present time, knowledge of

movements in the field by the parasites is unknown and until known, data would be questionable.

A fourth method, rearing, was most successful and gave the most information. The aphid hosts were collected and temporarily maintained in hopes that they were parasitized.

Procedures and techniques must be exacting if optimal results are to be achieved. Success cannot be attained without a complete understanding of the biologies of the various members of the system and a good field knowledge of aphid biology and habitat.

Initial procedure was collection of the aphids. The most commonly parasitized aphids were those which were exposed on new plant growth, but gall and root aphids were also parasitized. Aphids were collected by removing the vegetative part they were on to a plastic bag, which was closed with a rubber band or "twist-um." Aphids that are normally well dispersed or at low density may be concentrated by beating them from vegetation and placing them on a smaller piece of host vegetation.

Samples were taken to the laboratory and cleaned of predators, set up on fresh "bouquets," and confined in containers to await emergence of primary and secondary parasites. Aphid predators may consist of any or all of the following: Coccinellidae (adults and larvae), Hemerobiidae and Chrysopidae (larvae) and Syrphidae and Chamaemyidae (larvae). These were easily removed by shaking or tapping the branch until all organisms were knocked into an enamel pan or onto a sheet of white paper where predators were easily seen and could be manually removed. (If predators were not removed, one larva could destroy a colony of aphids in a short time.) The aphids were then returned to the plant part.

The aphids had to be kept on fresh growth until parasitized ones mummified. This could be accomplished by wrapping the end of the plant part with cotton and forcing it into a vial containing either a nutrient solution or plain water. Aphid colonies could be kept for approximately two weeks or longer when set up on "bouquets" in this manner.

Various sized containers were used to store the bouquets with their aphids. The containers must breathe so that fungi will not develop; they must be of an adequate size to hold the sample; and they should have a top that is transparent, allowing one to view the contents. Containers used varied from small vials to small untreated paper ice cream containers, and to larger gallon paper containers with plastic stretched over the top for viewing purposes. Parasitized aphids (with the terminal stages of the primary parasite inside the aphid) become mummified by the parasite, which forms a thin, usually globular, case called an aphid mummy. The mummy is composed of the distended exoskeleton of the aphid and takes various forms, depending upon the species of primary parasite. This will be discussed in more detail in the section on host specificity.

Parasitization of aphids by primary parasites usually occurs in the mid-instar to late-instar stages; parasitization of the primary parasite by the hyperparasite occurs at two distinct times. The Alloxystinae and the encyrtid *Aphidencyrtus,* oviposit into the larva of the primary parasite while the aphid is still alive, the pteromalids *Asaphes, Coruna* and *Pachyneuron,* and the scelionid *Lygocerus,* oviposit into the primary parasite, mature larva, or pupa, after mummification occurs. This complicated rearing techniques, in that, if all mummies were allowed to remain in a single container and mummy ovipositing hyperparasites emerged first, they may oviposit in the other mummies, thereby causing the death of unemerged alloxystine or primary parasites. The procedure followed to prevent this was the individual isolation of each mummy in a small, cotton plugged vial at the time the bouquet was made, and to check the bouquet every 2 or 3 days and isolate other mummies as they formed. If no mummies were present with the initial aphid collection, the presence of mummy hyperparasites is precluded, and individual isolation was not necessary. However, individual isolation was followed in all cases, as it was found that on occasion a single aphid sample would be composed of several similar species of aphids which were not separable on sight. If later, two or more species of aphids were recognized, they could not be associated with a host unless they had been isolated.

Preparation of Study Material—The small size (0.7-2.0 mm) of these insects necessitated special preparation of various parts before they could be studied in sufficient detail. The characters that were found most useful in separating species were the comparative measurements of wings and antennal segments, the characters of the mesopleuron, and the topography of the mesonotum and scutellum.

The extent of the mesoscutal furrow, the character of the scutellar furrows, the presence of the mesopleural suture and the degree of setation and color, were best viewed on pointed specimens. The characters of the antennae and wings were best studied on slide mounted specimens.

The initial procedure used to prepare the antennae and wings for study was to clear the entire specimen in 2% KOH for 10 to 15 minutes under moderate heat and then dissect the wings and antennae for slide mounting. Commonly, the antennae would break between the second and third segments and the wing would tear when this procedure was followed; the remainder of the specimen was of little value if remounted. The easiest and most satisfactory method of removing the antennae and wings was to apply pressure against the parts, they would break from their respective sockets intact, leaving the pointed insect available for study. The removed part was transferred to Essig's aphid fluid for relaxation and clearing in preparation for mounting. Hoyer's mounting medium was used for most specimens as it afforded the simplest and quickest method for preparing large numbers of slides. The antennae, in some species, would collapse when transferred from Essig's to Hoyer's solutions, but

could be returned to normal by heating the slide to a temperature of 60°C, and allowing the media to boil under the cover slip for 2 to 3 seconds.

Measurements of the lengths of antennal segments and ratios of various wing characters were done with an eyepiece mircometer in a compound microscope at magnifications of 25× to 400×. Illustrations of various structures were made with a Zeiss compound microscope utilizing a Nikon FTN.

BIOLOGY

All Alloxystinae whose host associates are known, are hyperparasites. They are primary parasites on Aphidiinae (Braconidae) and Aphelinidae, which are parasites of Aphididae. In spite of their wide distribution, numerous species and common association with an economic pest group, there is very little known of their biology or host relationships.

The biology of *Alloxysta victrix* (Westwood) has been extensively studied by Haviland (1921) in England, Gutierrez and van den Bosch (1970) in California. *Alloxysta brassicae* (Ashmead) was less extensively studied by Spencer (1926) in North Carolina, as was *Alloxysta ancylocera* (Cameron) by Hafez (1961) in Holland. During the course of this study many observations were made of various Alloxystinae species, but no particular species was studied in detail.

The behavior of *Phaenoglyphis americana* Baker was observed on numerous occasions in the foothills around Riverside, California, on the *Encelia farinosa* (Gray)/*Dactynotus katonkae* (Hottes)/*Aphidius confusus* (Ashmead) complex. The hyperparasite could be seen flying from plant to plant in short flights that consisted of a series of short bounces. They always landed on sunlit leaves, where several minutes were spent in preening before moving into a leaf shaded area for prey. *Dactynotus katonkae* (Hottes) usually occurred in dense colonies on the terminal stems and leaves, but could be found in less dense concentrations on older growth and toward the base of leaves. The aphids when approached by the hyperparasite usually made jerky movements from side to side and extended their hind legs, which caused the parasite to fly or disturbed her searching and ovipositional behavior. Possibly for this reason, the searching *Phaenoglyphis* rarely were seen approaching the densely packed colonies, but were seen to search for single or sparsely congregated individuals. Those individuals rarely reacted as above when approached by the parasite. The parasite approached the aphid from any angle, palpated it with the antennae for several seconds and either left it or mounted and again palpated while turning on top of its dorsum. If the aphid was accepted, the parasite oriented itself, head to head, and

inserted its ovipositor into the abdominal dorsum. It may insert its ovipositor several times in the same host aphid, and on occasion one insertion may last as long as 5 minutes.

Ovipositional behavior of *Alloxysta victrix* in the *Medicago sativa* L./*Acyrthosiphon pisum* (Harris)/*Aphidius smithi* Sharma and Subba Rao complex was studied in detail by Gutierrez and van den Bosch (1970). It was found that the hyperparasite preferred second or third instar aphids and would oviposit into all developmental stages found in the haemocoel of live parasitized aphids, including the embryionated eggs. An aphid may be probed numerous times and supernumary eggs may be deposited, only one of which will complete development. Unparasitized aphids are commonly probed, but never oviposited in. The hyperparasite was quite active in the searching and probing behavior, but when the host was found and actual egg laying was in process, the parasite became very still.

The development of *Alloxysa victrix* (Westwood), as elucidated by Gutierrez and van den Bosch (1970), began upon eclosion of the egg in the haemoceol of the primary parasite. This normally occurred just after the primary parasite mummified the aphid. It was not known exactly how many larval instars there are, but it appeared there were two or three molts in *victrix.* The hyperparasite developed within the haemoceol of the *smithi* larva until it reached about two-thirds of its ultimate size, at which time it broke through its host's integument and proceeded to consume the remainder of the host, a process which took several days. Total time of development ranged from 20 days in *victrix,* Gutierrez and van den Bosch, (1970), to as much as 4 months in diapausing *Phaenoglyphis americana* Baker.

Pupation followed voiding of the meconium; the larva did not spin a cocoon, but utilized the one spun by the primary parasite prior to its death. The duration of the pupal stage in *Alloxysta victrix* (Westwood) varied from 8 to 11 days in California (Gutierrez and van den Bosch, 1970) to 22 to 26 days in England (Haviland, 1921). Adults emerge from the mummy by chewing an irregular hole in the dorsum.

Adult *Alloxysta* and *Phaenoglyphis* could be kept in the laboratory for extended periods on a honey diet. In rearing containers without food, death came in no more than 3 days for most species, but when fed a honey-protein extract they lived as long as 2 weeks. Gutierrez and van den Bosch (1970) found that under normal laboratory conditions *Alloxysta victrix* (Westwood) lived 3 to 8 days, but when kept in a cool sheltered place out of doors they lived up to 135 days. In the field *Alloxysta* probably feed on the nectar of flowers. The species in Table 1 were observed in the field on flowers where they were apparently feeding on nectar.

TABLE 1. Food plant associations of Alloxystinae

Phaenoglyphis ambrosiae Ashmead	*Salvia apiana* Jeps.
	Salvia mellifera Greene
Phaenoglyphis gutierrezi n. sp.	Umbelliferae
Alloxysta megourae (Ashmead)	*Spiraea* sp.
	Prosopis sp.

Facultative diapause was recognized in several species of *Alloxysta* (as *Charips*) by Schlinger (1960) and by Schlinger and Hall (1960) for various California aphid hosts. In this study, diapause has been demonstrated for *Alloxysta* and *Phaenoglyphis* species on numerous occasions during rearing. It was observed that normal emergence of the primary parasites occurred over a 3 to 7 day period, followed by a lull of 3 to 7 days, and then an emergence period of 3 to 7 days by the hyperparasite. On occasion, some mummies did not yield either parasite or hyperparasite in this time period, but dissection of the mummy several months later showed a healthy full grown larva of a primary or hyperparasite. The primary parasites have on several occasions, under normal laboratory conditions, emerged as much as a year later and one collection of *P. americana* Baker emerged more than 5 months later. It was possible in some cases to break diapause by placing the specimens in a refrigerator at 7 ± 2.5°C for 1 to 2 weeks, emergency occurring after the specimens were transferred to open temperature. It is speculated that the function and mechanism of diapause in any particular species differ from other species and is based on the host aphid or the aphids presence in a particular set of environmental conditions.

HOST SPECIFICITY

Terminology—The study of host specificity is confusing at times because of different meanings assigned to the terms used to describe the relationships between parasites and their hosts. I will define the terms as they are used here.

Host specificity—A parasite is said to be host specific if, in its normal environment, it is restricted to a host or several hosts at the exclusion of other available hosts which are closely related to the utilized host and would appear to be acceptable.

Host suitability—If an insect parasite can be shown to develop to maturity on a particular host, the host is said to be suitable.

Host preference—A parasite is said to exhibit host preference if in having several suitable hosts, it utilizes one to a greater degree than the others. Even though an aphid may be proven to be a suitable host in laboratory tests, it does not follow that it will be utilized in the field.

Methods of study—There are two ways to study host association: 1)

laboratory exposure tests, and 2) field survey sampling.

Laboratory exposure tests involve presenting a host or pair of hosts to the parasite and recording the results. Successful rearing of a parasite demonstrates host suitability; the unsuccessful trial may result from a refusal of a parasite to probe, oviposit, or failure to develop if oviposition does take place. Unsuccessful development usually indicates a physiologically unsuitable host and usually involves encapsulation by the host. The differential selection of one of a pair group indicates preference.

Laboratory experimentation has the weakness of being done in an artificial environment. Positive host associations can be demonstrated that would never or only rarely occur in the natural environment. Laboratory studies, by themselves, do not indicate correlations with host specificity as they occur in nature.

Field survey sampling involves the collection and rearing of hyperparasites from their associated hosts. It seems logical that the discovery of a hyperparasite's host associations in its native habitat is a statement on its host specificity and/or host preference. The problem is to decide how many records are necessary before such a statement can be made. It is generally accepted that continued rearing of a parasite from a specific host, and the absence of rearing associations from hosts that are closely related to the recognized host and are available to the parasite, is an acceptable statement on specificity.

An additional problem when dealing with a hyperparasite is to determine what trophic level or trophic levels are attractive to the hyperparasite. The Alloxystinae exist in a system in which three trophic levels exist: host plant, host aphid, and host primary parasite. In most cases, the three exist as an evolutionary unit with the aphid having a degree of specificity to the plant and the primary parasite having a degree of specificity to the aphid. It is not unlikely that in some cases, the whole unit is needed for the searching hyperparasite to successfully locate its host and oviposit. The plant may attract the hyperparasite by odor, shape or color, or the hyperparasite may perceive the aphid or primary parasite by following pheromone gradients. The only test of this kind was by Read, Feeny and Root, 1970, who found that *Alloxysta brassicae* (Ashmead) was not attracted to *Brassica oleracea* L. oil extract, but showed an apparent attraction to the females of the primary parasite, *Diaretiella rapae* (M'Intosh).

Alloxystiniae host associations—the data presented here was for the most part gathered by members of the University of California Riverside and Berkeley working on a cooperative aphid-parasite project. Approximately 2,500 aphid collections were made. These yielded approximately 1,800 primary parasite associations and 200 Alloxystinae associations. Data taken was sporadic, it was most intensive in spring (about 80% of the records are from spring months). The summer months were lightly collected and the fall months were more heavily collected. Intensity of

collecting correlates strongly with times of maximum aphid presence.

Association of the host plant and host aphid with the hyperparasite is easily done. Association of the host primary parasite is more difficult. When a hyperparasite emerges from an aphid mummy, it has destroyed the primary parasite and the identity of the primary must be inferred, usually by the mummy type. If the hyperparasite and one species of primary parasite are reared from a sample and the mummies are the same, it is logical that the hyperparasite's primary parasite host was the same as the reared primary parasite. The sample may yield no primary parasite or more than one primary parasite. Determination of the primary parasite can be made in these situations because of the distinctiveness of the mummy cases formed by the various primary parasites. *Aphelinus* mummies are cigar-shaped and black; *Ephedrus* mummies are round and black; *Aphidus, Trioxys, Lysiphlebus* and *Diaeretiella* mummies are round and pale and in mixed samples can usually be differentiated on a basis of color and size; *Praon's* mummified aphid sits on top of the cocoon the parasite spins after leaving the aphid mummy. A generic determination is almost always possible, and a specific determination is possible about one-half of the time.

Results—Alloxystinae are not species specific in their host associations. Seven species included in this study were reared on numerous occasions, and each showed a wide range of host associations at each trophic level. The species with a large number of host associations are *Alloxysta brassicae* (Ashmead), *A. Lachni* (Ashmead), *A. victrix* (Westwood), *A. xanthopsis* (Ashmead), *Lytoxysta breviapalpis* (Kiefer), *Phaenoglyphis ambrosiae* (Ashmead) and *P. americana* (Baker).

Host associations are best known in *Alloxysta victrix* (Westwood). It was reared from numerous hosts and was the subject of extensive field and laboratory host suitability and host preference studies by Gutierrez (1970) and Guiterrez and van den Bosch (1970). These studies were restricted to the alfalfa habitat in the San Francisco Bay area. Their results showed that *victrix* was extremely specific in the field, being almost totally restricted to the *Medicago sativa* L./*Acyrthosiphum pisum* (Harris)/*Aphidius smithi* Sharma and Subba Rao host association in spite of the presence of several other primary parasites as *Monoctonus paulensis* (Ashmead) on *Acyrthosiphum pisum* (Harris) and *Trioxys complanatus* (Quilis) on *Therioaphis maculata.* The *Monoctonus paulensis* (Ashmead) association was not found in the field. *Aphelinus howardi* (Dalla Torre) was rejected by the hyperparasite and *Praon exoletum* (Nees) was rejected physiologically.

In the survey rearing records (Table 7), *Alloxysta victrix* (Westwood) is seen to be associated with many plant, aphid and primary parasites. The majority of records are from Dactynotinae aphid species parasitized by *Aphidius* species; there were also several species of Aphidinae/*Aphidius* sp. utilized as hosts. One interesting record is the

rearing of *victrix* from the *Lycopersicon esculentum* (Mill)/*Macrosiphum euphorbiae* (Thomas)/*Aphelinus howardi* (Dalle Torre) complex. In the studies by Gutierrez and van den Bosch (1970) *Aphelinus howardi* (Dalle Torre) was rejected by *Victrix*. Gutierrez also found that *Praon exoletum* (Nees) on *Therioaphis maculata* (Oestlund) was physiologically rejected by encapsulation, but I have records for a *Praon* sp. on an undetermined *Macrosiphun* on Rose. These records would seem to indicate that generalizations about host suitability are difficult to make.

Two *Phaenoglyphia* species, *ambrosiae* (Ashmead) and *americana* (Baker), have wide host association records (Tables 4 and 5), but at the same time show definite differences in preferences in aphid hosts and primary parasite hosts. Both species are common in Southern California and are found at the same time of the year and in the same habitats. Their hosts are mutually available. *Phaenoglyphis americana* shows a much more restricted aphid association than does *ambrosiae;* the majority of its associations are from Dactynotinae aphids, while the *ambrosiae* records of association are equally distributed among aphids from the Dactynotinae and Aphidiinae. The main differences in primary parasite hosts are the absence of records of *americana* from *Lysiphlebus testaceipes* (Cresson) and *Diaeretiella rapae* (M'Intosh) and the paucity of *ambrosiae* records from *Ephedrus.* They share several hosts in *Aphidius confusus* (Ashmead), *A. alius* (Muesebeck), and *Praon unicus* (C. F. Smith).

Alloxysta brassicae (Ashmead) shows a distinct preference for aphids in the Myzini, including *Brevicoryne brassicae* (L.) *Hyalopterus atriplicus* (L.) and *Myzus persicae* (Sulzer) (Table 6). Most of the known primary parasite records are *Diaeretiella rapae* (M'Intosh).

Alloxysta lachni (Ashmead) is known only from coniferous trees and aphids of the genus *Cinara.* No primary parasites are known, but by inference of other *Cinara* parasites throughout the world, they are probably Pauesia.

Alloxysta xanthopsis (Ashmead) demonstrates a definite preference for the primary parasite *Lysiphlebus testaceipes* (Cresson); nine of the twelve known host associations are from this parasite (Table 8). There seems to be a little specificity to aphids, as species from four subfamilies serve as hosts.

Host associations of various species in each genus have been compiled into tabular form (Tables 2 and 3). The taxonomic categories of the aphids were combined, so that the lowest taxonomic level listed is generic. The matrix of the table indicates whether or not a particular aphid or primary parasite was utlized as a host. The numbers in the matrix indicate the number of species in the host category that were associated.

Utilization of aphid hosts by various Alloxystinae genera (Table 2) shows that the monotypic *Lytoxysta* and *Hemicrisis* are much more

limited in their host associations than *Phaenoglyphis* and *Alloxysta*. *Hemicrisis* is only associated with the primitive conifer inhabiting subfamilies Cinarinae and Lachiinae. *Lytoxysta* is restricted to the subfamilies Aphidinae and Dactynotinae; its aphid host preference is strongly oriented toward *Aphis* species and their parasites. *Phaenoglyphis* and *Alloxysta* are known from many aphid hosts. *Alloxysta* is positively identified from aphids in seven different subfamilies, including 30 species. *Phaenoglyphis* is more restricted in its host aphid associations, it is not associated with four of the aphid subfamilies that *Alloxysta* is associated with and is not associated with many of the Aphidina genera that serve as hosts for *Alloxysta*. Dactynotinae aphids are recorded as hosts for *Alloxysta* and *Phaenoglyphis* in equal numbers of both genera and species.

TABLE 2. Summary of the host associations between Alloxystinae and Aphididae at the generic level. The numbers in the matrix indicate the number of host species recorded as hosts.

		Lytoxysta	*Hemicrisis*	*Phaenoglyphis*	*Alloxysta*
Cinarinae	Cinara		1	1	2
Lachninae	Tuberolachnus		1		
Chaitophorinae	Chaitophorus				1
Callaphidinae	Chromaphis				1
Therioaphininae	Therioaphis				1
Saultusaphininae	Iziphya				1
Aphidinae	Aphis	5		6	6
	Brevicoryne				1
	Capitophorus				1
	Euceraphis				1
	Hyalopterus				1
	Myzus			1	1
	Neomyzus				1
	Rhopalosiphum			2	
Dactynotinae	Acyrthosiphum			1	2
	Amphorophora			1	
	Dactynotus	1		1	2
	Macrosiphum	1		8	6
	Masonaphis				1
	Sitobion			1	
	Wahlgreniella				1

The most common aphid hosts are the genera *Aphis* and *Macrosiphum,* over one-half of the species associated with Alloxystinae were from these two genera. The most primitive subfamily of Aphididae, the Cinarinae, was surprisingly utilized as a host for three of the four genera of Alloxystinae. An interesting aspect of this relationship is that the species utilizing them represent the most divergent species in both *Alloxysta* and *Phaenoglyphis.*

Genera of primary parasites serving as hosts for the Alloxystinae are shown in Table 3. The pattern for primary parasite host utilization by the Alloxystinae is similar to the pattern of aphid host utilization. The monotypic genera have narrow host associations and the polytypic genera are generally distributed with associations in most available genera. The most obvious differences are the lack of Aphelinidae associates recorded for *Phaenoglyphis* and the lack of Ephedrinae associations by *Alloxysta. Aphidius* species were most commonly associated with *Lytoxysta, Phaenoglyphis,* and *Alloxysta;* they comprise almost 50% of the associated species and more than 50% of the total samples yielding Alloxystinae continued *Aphidius* species.

TABLE 3. Summary of the host association between the Alloxystinae and their primary parasite host at the generic level. The numbers in the matrix indicate the number of host species recorded as hosts.

		Lytoxysta	*Hemicrisis*	*Phaenoglyphis*	*Alloxysta*
Ephedrinae	Ephedrus			1	1
Prainae	Praon			2	1
Aphidiinae	Aphidius	3	1	7	5
	Diaeretiella			1	1
	Lysiphlebus	1		1	1
	Monoctonus			1	
	Pauesia			1	
	Trioxys			1	2
Aphelinidae	Aphelinus				3
	Mesidia				1

CONCLUSIONS:

1. Host specificity in the Alloxystinae is not a simple association between the hyperparasite and primary parasite. The association is influenced by a preference for certain aphids and possibly for certain host plants.
2. There are no species-specific host associations known, although in some cases there is a pronounced preference for a particular aphid-primary parasite combination.
3. There is a certain degree of preference shown by most species, as indicated by the numerous rearings of Alloxystinae species from certain hosts at the exclusion of other available hosts.
4. No known species can be defined by its host associations.
5. The genera cannot be defined by their host associations.

GEOGRAPHIC DISTRIBUTION

The Alloxystinae are a widely distributed group of insects; they are known from every continent and the oceanic island of Hawaii. They range from above the Arctic Circle in Lappland and Alaska to 47° S in Argentina and have been collected at elevations above 2,750 m. in Arizona to below sea level in the Imperial Valley of California. They are of course limited in their distribution to those places where aphids and their primary parasites are found and therefore are poorly known in the tropics and best represented in temperate regions.

MORPHOLOGY

Species within the various Alloxystinae genera are quite similar, but several characters vary sufficiently to be useful in separating the species. The genera are easily separable based on a number of characters. The characters in some cases are based on size, ratios, and degree, and as such must be carefully defined. This section will explain the various characters used and discussed in the following keys and descriptions.

Sculpture—Alloxystinae have been separated from Cynipidae by their lack of sculpture. This has been confusing, since the structures exhibiting the sculpture and the nature of the sculpture have not been defined. The Alloxystinae do have sculpture; *Lytoxysta* has a reticulate network on the antennae, head, thorax and coxae as revealed by the scanning electron microscope (Fig. 13), while *Phaenoglyphis* and *Hemicrisis* have furrows and pits on the mesopleuron and mesonotum. The rugose character of the thorax of many Cynipinae is not found in the Alloxystinae.

Thorax—The thorax (Fig. 1) has several morphological structures

important in defining the Alloxystinae genera and *Phaenoglyphis* species.

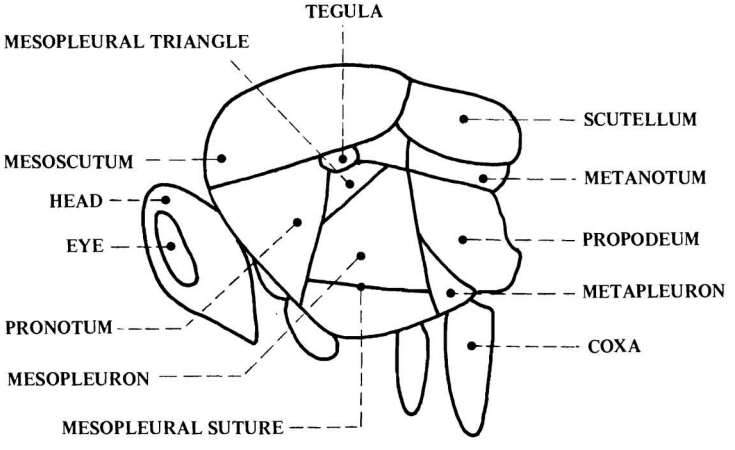


Figure 1. Generalized Alloxystinae thorax.

The mesopleuron, a rectangular sclerite occupying the central portion of the lateral thorax, has two important structural characters, the mesopleural triangle and the mesopleural suture. The mesopleural triangle, a triangular area formed on the upper anterior area, is depressed and densely setose. It is present in *Alloxysta* (Fig. 15), *Phaenoglyphis* (Fig. 16) and *Hemicrisis,* but absent in *Lytoxysta.* The remainder of the mesopleural surface is smooth, shiny and asetose. The mesopleuron may be divided by a straight suture, perpendicular to the anterior and posterior margins (Fig. 1). Cameron (1890) considered it as a keel separating the pleuron and sternum, while Snodgrass (1910) treated it as a median episternal groove, and Hellen (1931) referred to it as a mesopleural suture. I have used mesopleural suture. The genera *Lytoxysta* and *Alloxysta* (Fig. 15) lack this suture, but it is present in *Hemicrisis* and *Phaenoglyphis* (Fig. 16).

The mesonotum (Fig. 2) is divided into two parts, the mesoscutum and scutellum; both possess important taxonomic characters. The anterior division, the mesoscutum, is a convex, oval sclerite forming the major portion of the thoracic dorsum. It may have two parallel longitudinal sutures extending from the base forward. These sutures may extend the full length or extent anteriorly one-third to one-half the length of the mesoscutum. They may also be distinct basally and faint anteriorly. Foerster defined the genus *Phaenoglyphis* on the presence of this character. I have redefined *Phaenoglyphis* on the basis of several characters and within this framework, the sutures may be continuous (Fig. 10), partial or absent (Fig. 11). In *Alloxysta* the sutures are absent and the mesos-

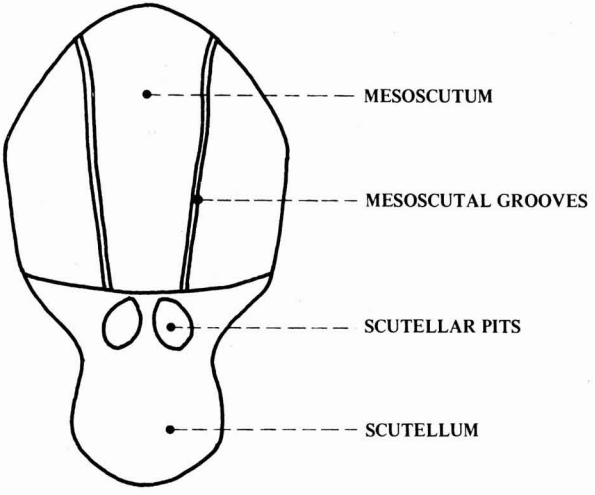


Figure 2. Generalized Alloxystinae mesoscutum (dorsal view).

cutum is almost oval, but wider than long (Fig. 14); in *Hemicrisis* the sutures are faintly impressed in the basal one-fourth and the mesoscutum is oval (Fig. 12). In most species, the texture of the mesoscutal surface is smooth, shiny, with a few setae anteriorly and parallel to the position of the mesoscutal sutures (even if the sutures are absent), but in *Hemicrisis* the entire surface is densely setose (Fig. 12) and in *Lytoxysta* reticulate sculpture is present (Fig. 13).

The scutellum forms the posterior section of the mesonotum and is separated from the mesoscutum by a distinct suture. It is greatly constricted directly behind the mesoscutum, but slightly expanded posteriorly so that it appears pear-shaped when viewed from above. In *Hemicrisis* and *Phaenoglyphis* two pits are present on the anterior margin, while in *Alloxysta* and *Lytoxysta* they are absent.

The description of *Hemicrisis* by Foerster (1869) states that no pits are present, however there are two faint, lightly impressed, narrow, lanceolate depressions (Figure 12 is a scanning electron micrograph of a paralectotype from the Foerster type series, the depressions are clearly visible).

In the genus *Phaenoglyphis* the pits are clearly present and are separable into two types. The most prevalent type consists of two irregular pits, separated by a thin wall, that are hemispherical in shape (Fig. 10). Species that have this type have distinct mesoscutal grooves. The second type, found in species that lack mesoscutal grooves, is two deep pits, rectangular in shape when viewed from above (Fig. 11).

Wing—The wing of Alloxystinae is similar to the generalized Cynipid

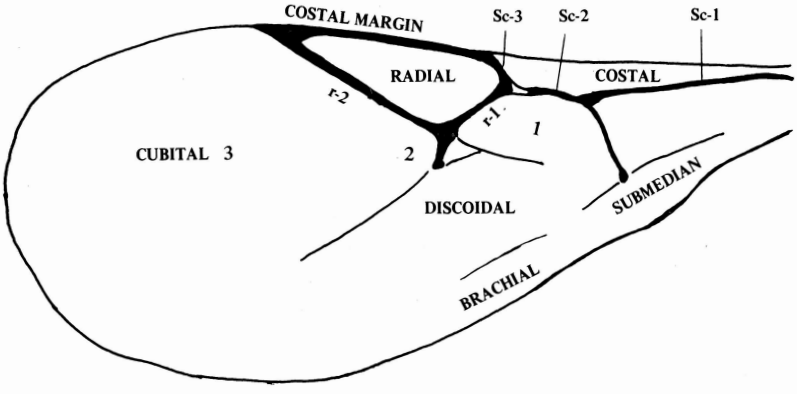


Figure 3. Generalized Alloxystinae wing.

wing as depicted by Rohwer and Gahan (1916). Their terminology, which is basically the same as that used by Dalla Torre and Kieffer (1910) and Weld (1952), is used below. Figure 3 depicts a generalized wing. Venation may be quite reduced as in *Lytoxysta* and several short winged species from Europe, but generally the radial cell is formed, although it may be open on the coastal margin. The areolet (Cu-2) is rarely formed, but may be partially so in several *Phaenoglyphis* species. The taxonomic characters of the wings are ratios of measurements of the radial cell and the length and width of the wing. Previous workers have used various ratios, but did not specify exactly how their measurements were taken, and did not indicate that there are statistically significant

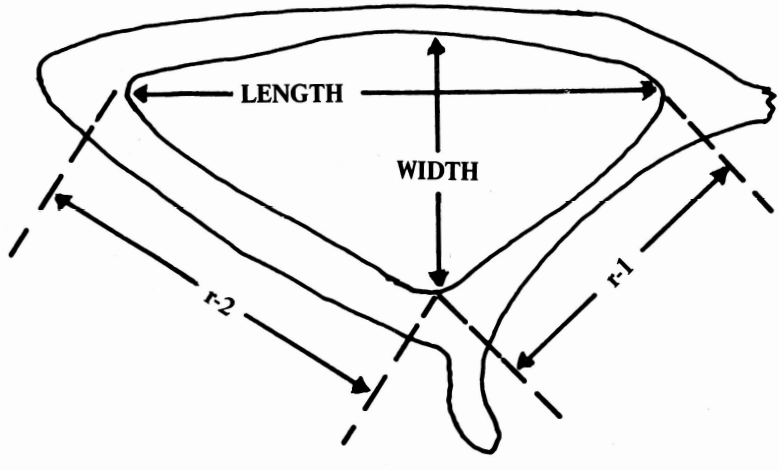


Figure 4. Alloxystinae radial cell showing measurements of taxonomic character.

differences between the ratios of males and females in some species. The ratios given below cannot be correlated with any in the literature for the preceding reasons. Figure 4 shows the way in which radial cell measurements were taken.

Wing length is a measurement taken from the pleural attachment to the apex of the wing. Body length is measured on pointed specimens and is the distance from the vertex to the tip of the abdomen.

Antennae (Fig. 5)—Characters of the antennae are the most distinctive, least variable and most useful in separating various species of Alloxystinae. Males have 14-segmented and females 13-segmented antennae, except in *Lytoxysta* where the antennae of both sexes have 13 segments. The antennal segments are numbered consecutively from the scape (segment 1) to the apical segment of the club (segment 13 or 14).

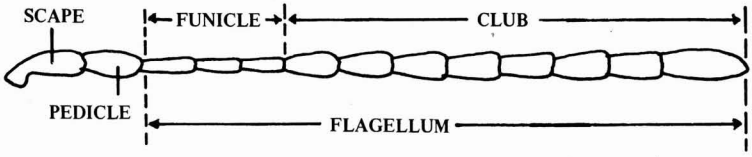


Figure 5. Generalized Alloxystinae antenna.

The most valuable segments taxonomically are segments 3 to 5. Males may have all or any combination of these segments bowed or straight. The male of *Phaenoglyphis* usually has the third and only the third segment bowed, *Hemicrisis* has the third segment bowed, *Alloxysta* may have segments 3, 4 and 5 or 4 and 5 bowed, or only segment 4 bowed; segment 3 is never bowed alone. The comparative length and width of segments 3, 4 and 5 in conjunction with shape and character of the bow is diagnostic for all known species. Figure 6 shows how the measurements were taken.

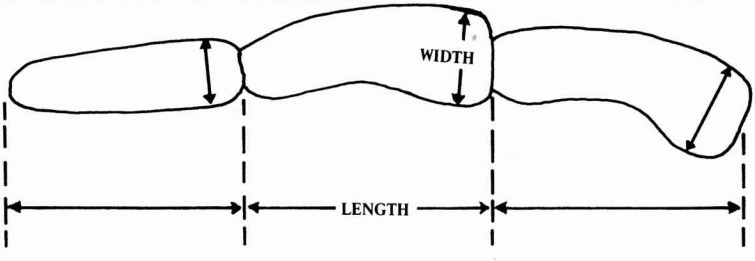
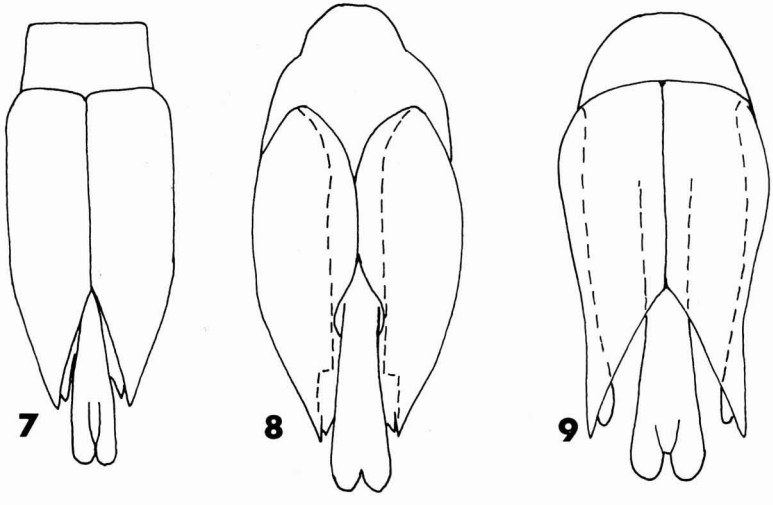


Figure 6. Alloxystinae antennal segments 3–5 showing measurements of taxonomic characters.



Figures 7–9. Alloxystinae male genitalia. Dorsal view. Fig. 7. *Lytoxysta brevipalpis* Kieffer. Fig. 8. *Phaenoglyphis americana* Baker. Fig. 9. *Alloxysta xanthopsis* (Ashmead)

Male genitalia (Figs. 7–9)—The phallus is quite simple, being little more than a hollow tube through which the aedeagus passes. The aedeagus is a straight, cylindrical rod, slightly expanded distally and with the tip bifurcate. The tube is formed by a dorsal fusion of the darkly sclerotized parameral plate and a membranous ventral portion that is produced anteriorly to form the basal ring. The parameres are distally bilobed. The dorsal lobe forms the paramere and is usually smooth and accuminate. The ventral lobe, the digitus, terminates obtusely and is armed with dark, sclerotized teeth.

The structure of the phallus is quite similar in the three genera studied, with main differences being in the degree of sclerotization on the ventral surface, the width of the tube distally, and the form of the basal ring. Figure 7 shows the phallus as found in *Alloxysta xanthopsis* (Ashmead), *victrix* (Westwood), *halli* n.sp., and *brassicae* (Ashmead); it is characterized by absence of ventral sclerotization and wide separation of the parameres distally. *Lytoxysta brevipalpus* (Kieffer) is distinctive because of its quadrate shape and very narrow separation of the lateral plates ventrally (Fig. 8). Figure 9 is typical of the phallus of *Phaenoglyphis americana* (Baker), *calverti* n.sp. and *gutierrezi* n.sp. It is distinctive because of the reduction of the lateral plates dorsally and the knob-like extension of the basal ring.

SYSTEMATICS
SUBFAMILY ALLOXYSTINAE

This subfamily can be differentiated from other Cynipoidea subfamilies by the following combination of characters:

Abdominal tergites II and III occupying more than one-half the abdomen; body without rugose sculpturing; obligate secondary parasites of Aphidiidae or Aphelinidae using Aphididae as hosts.

KEY TO THE GENERA OF ALLOXYSTINAE

1. Mesopleuron with transverse suture (Fig. 16) 2
   Mesopleuron without transverse suture 3
2. Antennal segments 3–5 ridged and as wide as following segments; mesoscutum densely pubsecent; scutellar pits only faintly impressed (Fig. 12) ..... *Hemicrisis* Foerster
   Antennal segments 3–5 usually smooth and narrower than segments following; mesoscutum glabrous; scutellar pits distinctly impressed (Figs. 10 and 11) ..... *Phaenoglyphis* Foerster
3. Mesopleuron with reticulate sculpturing (Fig. 13) ..... *Lytoxysta* Kieffer
   Mesopleuron without reticulate sculpturing (Fig. 14) ..... *Alloxysta* Foerster

LYTOXYSTA KIEFFER

Lytoxysta Kieffer, 1909:479; Rohwer and Fagan, 1917:370; Weld, 1939: 53; Muesebeck et al, 1951:607; Weld, 1952:251.

Type Species—*Lytoxysta brevipalpis* Kieffer, 1909, by monotypy.

Diagnosis—*Lytoxysta* is the most distinctive genus in Alloxystinae. It is distinguished by a distinctive reticulate sculpture, 13 segmented antennae in both male and female, absence of the mesopleural triangle, insertion of antennae high on the head, wings of males aborted, those of females normal, but with reduced venation, and a mesoscutum flat in profile.

Distribution—This monotypic genus is restricted to North America, where it is distributed throughout the western one-third of the continent, but is known from only two locations in Eastern North America.

Discussion—This genus is the single entity within the Alloxystinae that differs in general facies. The body sculpture, equal segmentation of the antennae in both sexes, dimorphism of wing size, and lack of mesopleural triangle are characters that appear in none of the other 150 plus species of the subfamily. It is possible that it does not share common ancestry with other Alloxystinae and its inclusion brings about a polyphyletic grouping. However, its host associations (a character that generally defines the subfamilies), places it in the Alloxystinae.

LYTOXYSTA BREVIPALPIS KIEFFER
(Figs. 7, 13, 17, 18, 32, 33, 34)

Lytoxysta brevipalpis Kieffer, 1909:479; Rohwer and Fagan, 1917:370; Weld, 1939:53; Muesebeck et al, 1951:607; Weld, 1952:251.

Lytoxysta brevipalpis var. *nigra* Kieffer, 1909:479; Muesebeck et al, 1951:607; Weld, 1952:251. NEW SYNONOMY.

Adult female—Head, antennal segments 1–7, mandibles, pronotum, mesoscutum, scutellum, mesopleuron, metanotum, propodeum, ochraceous. Abdomen brown. Coxa, legs, antennal segments 8–13, honey yellow. Wing veins pale, almost transparent.

Head, antennae, pronotum, mesonotum, scutellum, ventral margin mesopleuron, coxae, legs with fine reticulate sculpture (Figs. 13 and 17). Head glabrous, slightly higher than wide, antennal insertion high on head, eyes oval, small, one-third length of head, gena broad, frons long. Mandibles small, rectangular, with two large conical teeth. Maxilla with fused galea and lacina forming lateral margins of mouth. Maxillary palpus four segmented, segments 1 and 2 subequal; 3 short; 4 elongate, slightly expanded. Labial palpus three segmented, segment 2 short, lightly sclerotized, segments 1 and 3 subequal. Antennae 13 segmented, subequal in length to body, segments cylindrical, closely jointed, segments 3, 4, 5 in ratio of 32:20:18 (32 = 0.11 mm) (Fig. 34). Pronotum expanding triangularly, ventral one-fourth densely setose, remainder glabrous. Mesoscutum glabrous, without furrows, flat in profile. Scutellum without pits or setation. Mesopleuron subrectangular, glabrous, without mesopleural triangle. Metanotum, propodeum, metapleuron densely setose. Abdomen six segmented, with fused segments II and III comprising more than one-half total length. Wing length to body ratio 95:60.

Venation incomplete, generally obscured; radial cell incomplete (Fig. 32). Wing appearing ciliated, but cilia are ridges in membranous matrix, not free. Body length 1.1 mm.

Adult male—As in female, except wing reduced to narrow, veinless, nonfunctional state, wing to body ratio 50:60.

Types—The locations of the types of both *brevipalpis* and *brevipalpis nigra* are unknown. Kieffer's original description cites the type locality as Forest Hills, Massachusetts, ex-*Aphis rumicis* on *Chenopodium album* and collected by Hayhurst. Three female specimens are in the USNM that are labeled as part of the "original lot" and obtained by exchange from the Fayetteville, Arkansas Museum. They are labeled Forest Hills, Mass., IX-22-1908, 388; without host or collector. Mr. E. P. Rouse, curator of the Fayetteville Museum, has searched for additional specimens, but states that none are now in the collection. Since Kieffer did not designate types and the certainty that the above specimens are the remainder of Kieffer's syntypical series, I now designate one specimen lectotype, the remaining two specimens are paralectotypes. The lectotype is labeled as follows: 1) Forest Hills, Mass., 22-1X-1908; 2) 388; 3) *Lytoxysta brevipalpis* Kieff., det. Weld, 1924; 4) ex- same lot as types, exch. with Fayetteville—1924; 5) (red label) lectotype, *Lytoxysta brevipalpis* Kieffer, 1909, Fred G. Andrews, 1970. The paralectotypes bear the following labels 1) 388; 2) (yellow) Paralectotype, *Lytoxysta brevipalpis* Kieffer, 1909, Fred G. Andrews, 1970.

Specimens examined—(154 females, 90 males) ALBERTA:Gilchrist Ranch, VI-28-1956. BRITISH COLUMBIA:2 mi. E. Lytton, VII-4-1966, compositae/*Dactynotus katonkae/Aphidius* sp.; 2 mi. S. Spencers Bridge, VII-4-1966, *Tragapogon* sp./*Dactynotus katonkae/Aphidius* sp. CALIFORNIA: Inyo Co.:Bishop, VI-16-1961, *Salix* sp./*Aphis saliceti/Aphidius* sp.; Los Angeles Co.:Lake Hughes, V-22-1959, *Rumex* sp./*Aphis rumex/Lysiphlebus testaceipes;* San Bernardino Co.:Wildwood Canyon, VI-11-1958, *Pyrus communis/Aphis gossypii/Lysiphlebus testaceipes.* COLORADO:Larimer Co.:Fort Collins, VIII-28-1968, *Populus* sp./*Aphidius* sp. IDAHO:Bannock Co.:Arimo, VIII-21-1938, *Artemesia* sp.; Franklin Co.:Mink Creek, IX-4-1937, aphid on sweet clover; Riverdale, VII-17-1937. *Aphis rumicis;* Twin Falls Co.:Castelford, VII-23-1929, Beets; Murtaugh, VII-23-1930. MANITOBA:Churchhill, VII-9-1952, VII-12-1952. MASSACHUSETTS:Forest Hills, IX-22-1908. OHIO:Franklin Co.: Columbus, X-10-1937, *Macrosiphum euphorbiae.* SASKATCHEWAN:Assinibola, VI-25-1955. UTAH:Davis Co.:Sunset, VII-15-1937, *Aphis helianthi.* Morgan Co.:Morgan, VII-3-1937, *Aphis artemisicola,* Rich Co.:Woodruff, VIII-30-1937, aphid on gooseberry; Salt Lake Co.:Murray, V-1913; Salt Lake, V-IX-1913. Sevier Co.:Joseph, VII-23-1937, aphids on sunflower. WASHINGTON:Lincoln Co.: *Artemisia tridentata/Aphis* sp./*Lysiphlebus testaceipes.*

Hosts—There are few host associations known for this species, but

these present a very interesting picture of host diversity in both aphid and primary parasite. The aphid hosts range from primitive Chaitophorinae (*Chaitophorus salicicorticis* (Essig)) to the highly evolved *Aphis* and *Dactynotus* of Aphidinae. Primary parasite records are limited to the genera *Aphidius* and *Lysiphlebus.*

The majority of records show a *Lysiphlebus testaceipes* (Cresson)/ *Aphis* sp. association. This association is generally found throughout North America and is exceedingly common; one questions why *L. brevipalpis* is uncommon, when apparently suitable hosts are available. In Southern California, thousands of specimens of *Lysiphlebus testaceipes* were reared from Aphidinae hosts and yet *brevipalpis* was reared only twice. A possible explanation is that most of our collections came from agricultural, horticultural, or desert environments. The known rearings of *L. brevipalpis* are all from riparian or canyon hillsides adjacent to riparian habitat and in environments unaltered by man. The association with *Lysiphlebus testaceipes* is probably a secondary association as this primary parasite was probably introduced. The evolutionary adaption may well be to the aphids and primary parasites of riparian habitat. This phenomenon was demonstrated in primary parasites by Stary (1970).

Geographic range—This species shows a rather remarkable distribution (Fig. 18). It is found from canyon chaparral of Southern California, northern coniferous forest of British Columbia, temperate deciduous forest of northeastern United States, to tundra of northern Manitoba.

Discussion—This species, in spite of its broad host range and wide distribution, is extremely uniform morphologically. In addition to the nominate species *brevipalpis,* Kieffer described a subspecies, *nigra,* that differed only in that it was black. He stated that it occurred with the nominate species on the same hosts. As two subspecies, by definition, cannot exist sympatrically, I am placing the entity *nigra* in synonomy with *brevipalpis.* The location of the type of *brevipalpis nigra* is unknown.

HEMICRISIS FOERSTER

Hemicrisis Foerster, 1869:339; Dalla Torre, 1893:36, Kieffer, 1900:113; 1904:17; Ashmead, 1903:142; Schmiedeknecht, 1907:408; Dalla Torre and Kieffer, 1910:293; Rohwer and Fagan, 1917:368; Muesebeck et al, 1951:608; Weld, 1952:254.

Type Species—*Hemicrisis ruficornis* Foerster, 1869, by monotypy.

Etymology—(hemi- = half, crisis = division). Apparently named for its intermediate position between *Phaenoglyphis* and *Alloxysta* in respect to presence of mesonotal furrows (*Phaenoglyphis*) and the absence of scutellar pits (*Alloxysta*).

Diagnosis—*Hemicrisis* is similar to *Phaenoglyphis,* in possessing mesoscutal furrows, scutellar pits and having the third antennal segment in the male bowed. It differs from *Phaenoglyphis,* in possessing mesoscutum densely pubescent, scutellar pits only faintly impressed (Fig. 12), antennal segments cylindrical and closely jointed, segments 3–5 equal in diameter to segments 6–13, segment 3 ridged, and known only from Lachninae aphid host associations.

Distribution—Known from Germany, British Columbia, Ontario, Saskatchewan, Quebec, California, and North Carolina.

Hosts—This genus is rare in collections, despite its wide geographic distribution, and has been associated with hosts only three times. Host aphids, in all cases, were members of the tribe Lachninae, including genera *Cinara* and *Tuberolachnus.*

Discussion—Retention of the monotypic genus *Hemicrisis* is somewhat questionable, in that the morphological differences between it and *Phaenoglyphis* are not as discrete as the respective differences between *Phaenoglyphis, Alloxysta,* and *Lytoxysta.* It is retained as a valid genus because of small differences in many characters and the specificity of association with the primitive Lachninae aphids and their assemblage of primary parasites.

In Foerster's description of the genus he states that there are no scutellar pits. I have had the opportunity to study the Foerster syntypical series of 5 specimens of *Hemicrisis ruficornis,* each of the specimens shows a faint, shallow scutellar pit. (Figure 12 is a scanning electron micrograph of one paralectotype, as can be seen, the scutellar pits are present.)

In 1907, Kieffer described *Hemicrisis nevadensis* from a single female specimen, and *Hemicrisis brevicornis* from a single male specimen; both species were from Ormsby Co., Nevada. I have studied these types at the California Academy of Sciences, and it is my opinion that both are synonyms of *Phaenoglyphis americana* Baker.

HEMICRISIS RUFICORNIS FOERSTER
(Figs. 12, 19, 29, 30, 31)

Hemicrisis ruficornis Foerster, 1869:339; Dalla Torre, 1893:36; Kieffer, 1900:113; 1904:17; Ashmead, 1903:142; Dalla Torre and Kieffer, 1910:293; Rohwer and Fagan, 1917:368; Muesebeck et al, 1951:608; Weld, 1952:254.

Adult female—Head, thorax, abdomen, wing veins and first antennal segment black-brown. Antennae gradually darkening from honey yellow second segment to pale yellowish brown terminal segment. Clypeus and legs honey yellow. Mandibles, maxillae and labium pale yellow.

Head width to length ratio 33:30. Genae, vertex to antennal insertion glabrous, remainder of head moderately clothed with curvate setae. Antennae 13 segmented, longer than body (ratio 90:75), segments 1–2 reticulate, sparsely setose; segments 3–13 ridged, regularly setose; segments 3, 4, 5 ratio 36:24:24 (36 = 0.18 mm) (Fig. 31). Pronotum and mesoscutum dull, densely clothed throughout with long decumbent setae. Mesoscutum with two deep, longitudinal grooves in posterior third. Scutellum with two lightly impressed pits anteriorly, densely setose. Mesopleuron opaque, bisected by distinct suture; mesopleural triangle equilateral, densely setose. Metanotum, propodeum, metapleuron, densely clothed with long curved setae. Abdomen shining, with basal ring of pale yellow setae. Abdominal segments I and II subequal, comprising one-half total length. Wing to body length ratio 110:75 (110 = 2.04 mm). Radial cell closed, large, length 2.7 times width; ratio of wing width to radial cell length and width 1.5 and 4.1 respectively (Fig. 29). Body length 1.4 mm.

Adult male—As female except antennae 14 segmented, segment 3 bowed (Fig. 30). Wing ratios similar to female.

Types—Weld (1952), states that there is one type female of *ruficornis* in Berlin and a male and female in Vienna. Dr. Konigsmann of the Humboldt University Natural History Museum has very graciously lent me the Foerster type collection and there are 5 specimens that appear to constitute the type series. They are all initialed by the same person, however each has a different collecting location and date. Only one has a determination label and it is possible that Mr. Weld overlooked the 4 specimens when he studied the material there. A lectotype for *ruficornis* is here designated, the remaining four are paralectotypes. Lecotype, male, labeled 1.) 1560 2.) *Hemicrisis ruficornis* Foerster, 1869, designated 1971, Fred G. Andrews. Paralectotypes: male, labeled 1.) 11/60; female, labeled 1.) 2562; male, labeled 1.) 2260; female labeled 1.) 762; all bear the yellow label, Paralectotype, *Hemicrisis ruficornis* Foerster, 1869, designated by Fred G. Andrews, 1977.

The type locality as stated by Foerster (1869) is Aachen, Germany.

Specimens examined—(7 females, 3 males) BRITISH COLUMBIA: Atlin, VIII-17-1955; 33 mi. W. Terrace, VI-II-1960. CALIFORNIA: Monterey Co.: Kirk Creek, VIII-10-1962, *Salix* sp./*Tuberolachnus salignus/aphidus salignae.* NORTH CAROLINA: Great Smokey Mountain National Park, V-28-1957. ONTARIO: Perrault Falls, VII-18-1961, *Cinara hottesi.* QUEBEC: Montigny, VI-11-1941; Payne Bay, VIII-2-1958. SASKATCHEWAN: Indian Head, IX-14-1954, *Picea glauca/ Cinara hottesi.*

Hosts—Knowledge of host association of this holarectic species is limited. There are no records from the palearctic and only a few from the nearctic region. All known associations have been with primitive aphids of the subfamily Lachninae (*Cinara* and *Tuberolachnus*). The

primary parasite association is *Aphidius salignae* Watanabe, specific on *Tuberolachnus salignus* (Gmelin), the niche in which the *Salix/Aphidius/Tuberolachnus* association occurs is redwood forest by the Pacific Ocean, while the *Picea/Cinara* niche is dense coniferous forest. It is of interest to note that the *Essigella/Diaeretus* association has not been shown to be utilized by *Hemicrisis,* even though it occurs with *Cinara* spp. on many hosts.

Geographic range—This species is widely distributed in North America (Fig. 19), but is known in Germany from a single collection. It is possible that it is distributed throughout the boreal area, as suitable hosts and habitat seem to be present.

Discussion—This species, perhaps more than any other, exemplifies the lack of material available. It is presently known from a single European record and seven North American records. North American records are scattered, the two closest are separated by more than 300 miles. The United States localities are 2,000 miles apart.

In spite of the great geographic separation, the specimens from Europe and North America are remarkably similar morphologically, even in respect to size.

Examination of the types has shown that they were not adequately characterized, probably due to lack of modern optical equipment. Scutellar pits are present. Accurate measurements of the radial cell, on slide mounted specimens, shows the ratio of the radial cell length to width to be 2.7 ± 0.1 ($n = 5$) and not "almost twice as long as wide" as reported by Foerster (1869) and Kieffer (1904), or "three times as long as broad" as stated by Weld (1952). The presence of the mesopleural suture has been overlooked by all workers.

PHAENOGLYPHIS FOERSTER

Phaenoglyphis Foerster, 1869:338; Cameron, 1879:114; 1890:235; Dalla Torre, 1893:36, Baker, 1896:131; Kieffer, 1900:113; 1904:12; Dalla Torre and Kieffer, 1902:42; 1910:293; Ashmead, 1903:142; Schmiedeknecht, 1907:408; Rohwer and Fagan, 1917:373; 1919:237; Dettmers, 1925:124; Hedicke, 1928:95; Muesebeck et al., 1951:608; Weld, 1952:255; Hellen, 1959:65; 1963:5.

Phaenoglyphis (Auloxysta) Hellen, 1963:7.

Allotria Westwood, 1833; Thomson, 1862:409 (in part); Ashmead, 1897:156 (in part); Cameron, 1883:367 (in part); 1889:58 (in part); 1890:254 (in part); Dalla Torre, 1893:29 (in part); Kieffer, 1904:63 (in part).

Allotria (Auloxysta) Thomson, 1877:812.

Hemicrisis; Cameron, (1877) 1886:89.

Allotria (Bothrioxysta) Kieffer, 1902:11; Dalla Torre and Kieffer, 1902:37; Kieffer, 1904:46.

Charips (Bothrioxysta); Kieffer, 1902:269; Dalla Torre and Kieffer, 1910:268; Weld, 1920:15; Haviland, 1921:452.

Charips (Charips) Marshall, 1870; Dalla Torre and Kieffer, 1910:280 (in part).

Hemicrisis Foerster, 1869; Cameron, (1877) 1886:89.

Alloxysta (Alloxysta) Foerster, 1869; Kieffer, 1904A:41 (in part).

Type species—*Phaenoglyphis xanthochroa* Foerster, 1869 designated by Foerster. There is a single female specimen in the Humboldt University Museum bearing the following labels: 1.) Luttich 2.) Weld, 1931 [round red circle] 3.) *Phaenoglyphis xanthochroa* female [printed by Foerster] [type of monotypy]. I have affixed a red label to the specimen bearing the following: Holotype, *Phaenoglyphis xanthochroa* Foerster, 1869.

Etymology—Phaeno (Gr. phaino) = to appear glyphis (Gr. glypho) = carved; refers to the scutellar pits, mesopleural; suture and mesonotal suture.

Diagnosis—*Phaenoglyphis* can be differentiated from *Alloxysta* and *Lytoxysta* by the presence of a transverse mesopleural groove (median episternal groove), pits at the anterior margin of the scutellum, two longitudinal furrows on the mesoscutum, large elongate radial cell, and bow in only the third antennal segment in the male. The genus is morphologically close to the genus *Hemicrisis,* but differs in having the scutellar pits distinct, antennal segments 3–5 smooth and narrower than succeeding segments and a host range that excludes the Lachnini.

Distribution—Known from North America, South America, Europe and Australia.

Adult—Body color ochraceous to brunneus. Appendages always lighter colored; antennae brown to honey yellow, basal segments lighter; legs pale yellow to honey yellow, occasionally with femur and tibia infuscated. Wings transparent, veins lemon to honey yellow.

Head slightly wider than long, rarely longer than wide. Antennae 13 segmented in female, 14 segmented in male, usually longer than body; segments 1–3 (rarely 1–5) smooth, remainder longitudinally ridged; smooth segments sparsely clothed with fine setae, ridged segments with stout, erect setae between ridges; segments one and two expanded, subequal; male with segments three and thirteen subequal and approximately one-third longer than subequal segments 4–12. Mandibles heavy, symmetrical, tridentate, outer edge sharp. Maxillary palpus four-segmented, slender, segment 4 elongate, with scattered sensory setae; inner lobe two segmented, first membranous, second sclerotized, densely setose. Labial

palpus three segmented; segments 1, 2 cylindrical, subequal; segment 3 oval, expanded, length equal to first two combined, distal one-half densely covered with stout sensory setae. Head setae hairlike, pale, curvate; dense on frons; moderate to absent on gena and occiput; sparse to absent anteriorly and posteriorly above level of antennal insertion.

Pronotum narrow behind head, expanding laterally in triangular shape; densely clothed with short, conical setae, which are curved pegs in ventral one-fifth, long and hairlike in dorsal four-fifths. Mesoscutellum smooth, glabrous, with two longitudinal furrows originating posteriorly, extending to middle, or obsolete; mesoscutellum setose anteriorly, laterally, and along furrow lines where furrows become obsolete. Scutellum smooth, shining, anteriorly with or rarely without two shallow or deep pits; laterally and posteriorly with long curved setae that converge at midline. Mesopleuron roughly rectangular; dorsally with depressed, densely setose triangular area (mesopleural triangle); remainder smooth, glabrous, shining, bisected by transverse suture across ventral third (median episternal groove, Snodgrass, 1910). Metanotum narrow, parallel strip beneath scutellum; laterally with oblong depressions; densely pilose. Propodeum round posteriorly with two vertical ridges posterior laterally, all with dense erect setae. Metapleuron narrow, triangular; suture between it and propodeum obscure. Coxae and legs unsculptured and moderately setose. Legs long and slender; wings transparent, ciliated, with fine distally-hooked setae; longer than body; venation simple; subcosta, radius and basal crossvein distinct; median, cubitus, first and second intercubitus present or absent, when present, faint; areolet may be formed, but always absolete; radial cell distinct, closed or rarely open on anterior margin.

Abdomen unsculptured; glabrous, except dense basal ring of setae; six segmented; measured along lateral line, segments 1 and 2 comprise one-half of abdomen; segment 2 longest segment; segments 1, 3, 4, 5, 6 subequal in length; segment 6 with spiracle. Tergites reduced, internal, except for small, posteriorly projecting pygostyles. Male genitalia simple (Fig. 8); with membranous basal ring, dorsally-fused lateral parameres, digitus of volsella and aedeagus. Female genitalia simple; with modified ninth tergite, fused second valvifer and gonostylus, slender second valvifer articulate from small quadrate first valvula.

Larva—Unknown.

KEY TO THE NEARCTIC SPECIES OF *PHAENOGLYPHIS*

Antennae 13 segmented ..... females
Antennae 14 segmented ..... males

FEMALES

1. Body ochraceous ..... *pilosus* n. sp.
   Body dark 2
2. Scutellum smooth, without pits ..... *laevis* n. sp.
   Scutellum with two pits anteriorly 3
3. Radial cell open on anterior margin ..... *ambrosiae* (Ashmead)
   Radial cell closed 4
4. Mesoscutum without longitudinal furrows 5
   Mesoscutum with two longitudinal furrows 7
5. Antennal segment five longer than antennal segment three ..... *pecki* n. sp.
   Antennal segment three longer than antennal segment five 6
6. Scutellar pits shallow, saucer shaped ..... *falcata* n. sp.
   Scutellar pits deep, cylindrical ..... *calverti* n. sp.
7. Antennae shorter than body length ..... *gutierrezi* n. sp.
   Antennae longer than body length 8
8. Antennal segment 3 cylindrical, with few longitudinal ridges, antennal segments 4 and 5 expanded and constricted basely *stenos* n. sp.
   Antennal segment 3 slightly expanded apically, without longitudinal ridges, antennal segments 4 and 5 cylindrical .... *americana* Baker

MALES *

1. Body ochraceous ..... *pilosus* n. sp.
   Body dark 2
2. Radial cell open on anterior margin ..... *ambrosiae* (Ashmead)
   Radial cell closed 2
3. Mesoscutum with two longitudinal furrows ..... *americana* Baker
   Mesoscutum without longitudinal furrows 4
4. Scutellar pits shallow, saucer shaped ..... *falcata* n. sp.
   Scutellar pits deep, cylindrical ..... *calverti* n. sp.

PHAENOGLYPHIS AMBROSIAE (ASHMEAD), NEW COMBINATION

(Figs. 11, 16, 22, 37, 46, 55)

Allotria ambrosiae Ashmead, 1897:156.

* Males of P. *gutierrezi,* P. *laevis,* P. *pecki* and P. *stenos* are not known.

Charips (Charips) ambrosiae; Dalla Torre and Kieffer, 1910:289.

Charips (Bothrioxysta) ambrosiae; Weld, 1920:15.

Charips ambrosiae; Muesebeck et al, 1951:607; Weld, 1959:22.

Adult female.—Head (except mouthparts), pronotum, mesoscutum, scutellum, mesopleuron, metanotum, propodeum, metapleuron, abdomen blackish-brown. Mandibles (except for reddish tips), maxilla, labium, wing veins pale lemon yellow. Antennal segments 1–5 and legs honey yellow. Antennal segments 6–13 reddish-brown.

Head slightly wider than long, shining; setae dense, long, procumbent on frons; remainder of head glabrous except for scattered, long, curvate, procumbent setae on vertex and gena; antennae 13 segmented, subequal to body length; segments 1–5 smooth, 6–13 ridged, segments 1–2 sparsely setose, segments 3–13 regularly setose; segments 3, 4, 5 ratio 21:19:19 (21 = 0.074 mm) (Fig. 55). Pronotum moderately clothed with appressed setae. Mesoscutum smooth, circular, without longitudinal grooves, with scattered decumbent setae anteriorly. Scutellum anteriorly with two deep oval pits; dorsum glabrous, lateral and posterior portion clothed with long, curve setae. Mesopleuron shining, glabrous, bisected by distinct transverse suture; mesopleral triangle small, densely pubescent. Metanotum, propodeum, metapleuron densely clothed with setae. Wing to body length 73:58. Radial cell open on anterior margin, length 2.6 times width (Fig. 37); ratio of wing width to radial cell length and width 1.8 and 4.6, respectively. Body length 1.1 mm.

Adult male.—Like female except antennae 14 segmented; segments 1–4 pale lemon yellow, segment 5 slightly expanded; radial cell length 2.7 times width; ratio of wing width to radial cell length and width 1.7 and 4.6, respectively. Antennal segment three not bowed. Antennal segments 3, 4, 5 ratio 26:24:25 (26 = 0.13 mm) (Fig. 46).

Types.—Lectotype, female, Cambridge, Massachusetts, W. H. Ashmead. Reared from *Dactynotus Ambrosiae* (Thomas) = *(Siphonophora ambrosiae)* and associated with *Aphidius polygonaphis* (Fitch) = *(Aphidius nigriceps,* Ash.).

The type specimen is located in the USNM and is labeled Type No. 2957. There are, however, two females on the same point, which is the designated type is not stated. The two specimens are by definition a syntypical series and a lectotype designation is necessary. I am designating the specimen closest to the tip of the point the lectotype and the one closest to the pin a paralectotype.

Specimens examined.—(155 females, 3 males) ALBERTA: Elkwater Lake, VI-9-1956; VII-21-1956. BRITISH COLUMBIA: Mission City, VII-3-1956. CALIFORNIA: Los Angeles Co.: Glendale, V-9-1966, *Pteridium* sp./ *Macrosiphum pteridus/ Aphidius* sp.; Los Angeles, XII-12-1958, *Chrysanthemum* sp./ *Rhopalosiphum rufomaculatum/ Lysiphlebus testaceipes;* Riverside Co.: Pedley, III-16-1959, *Malcomia*

maritima/ Rhopalosiphum pseudobrassicae/ Diaeretiella rapae; Riverside, IX-17-1956, *Hedera* sp./ *Aphis pseudohederae/ Lysiphlebus testaceipes;* IV-14-1957, *Abelia* sp./ *Macrosiphum rosae/ Praon unicus;* XI-19-1957, *Abelia gaucheri/ Macrosiphum* sp./ Aphidiinae; II-27-1958, *Artemisia dracunculoides/ Dactynotus ambrosiae;* III-3-1958, *Vinca minor/ Myzus persicae/ Aphidius matricariae;* III-21-1958, *Rosa* sp./ *Macrosiphum rosae/ Aphidius alius;* III-21-1958, *Miriabilis laevis/ Myzus persicae/ Lysiphlebus testaceipes;* IV-4-1958, *Rosa* sp./ *Macrosiphum rosae/* Aphidiinae; IV-7-1958, *Rosa* sp./ *Macrosiphum rosae/ Praon occidentalis;* IV-17-1958, *Rosa* sp./ *Macrosiphum rosae/ Praon* sp.; V-9-1958, *Abelia gaucheri/ Dactynotus ambrosiae;* I-22-1959, *Mesembryanthemum* sp./ *Aphis gossypii/ Lsiphlebus testaceipes;* IV-19-1959, *Rosa* sp./ *Macrosiphum rosae/ Praon* sp.; IV-27-1959, *Lycopersicon esculentum/ Myzus persicae/ Diaeretiella rapae; Nasturtium* sp./ *Myzus persicae/ Aphidius matricariae;* IV-4-1960, *Artemisia douglasiana/ Macrosiphaniella ludovicianae/ Ahpidius confusus;* IV-22-1960, *Ambrosia artemisifolia/ Dactynotus rudbeckiae/ Aphidius confusus;* II-9-1961, *Hibiscus* sp./ *Aphis gossypii/ Lysiphlebus testaceipes;* III-6-1961, *Rumex crispis/ Aphis fabae* and *Aphis helianthi/* Aphidiinae; III-13-1961, *Vinca minor/Myzus persicae/* Aphidiinae; III-16-1961, *Sonchus oleraceus/*Aphidiinae; *Chrysanthemum frutescens/ Aphis* sp./Aphidiinae; V-22-1962, *Rosa* sp./*Macrosiphum euphorbiae/* Aphidiinae; II-27-1966, *Avena* sp./*Rhopalosiphum padi/Lysiphlebus testaceipes* and *Ephedrus* sp.; *Crassula* sp./*Aphis gossypii/*Aphidiinae; V-7-1969 to V-18-1969, exmalaise trap. MASSACHUSETTS: Esex Co.: Melrose Highlands, V-15-1910, *Praon* sp. NEW BRUNSWICK: Pokiok, VIII-4-1950, *Nasturtium* sp.; Lincoln, VIII-9-1950, *Solanum tuberosa/ Myzus persicae.* NORTHWEST TERRITORY: Yellowknife, VII-17-1949. NOVA SCOTIA: Aylesford, VII-24-1963, *Acyrthosiphon pisum.* ONTARIO: Marmora, IX-9-1952; Ottawa, VII-31-1942; IV-20-1943; VIII-30-1943; VI-27-1944; VIII-4-1951; VI-3-1958; IX-1962, *Scirpus* sp./*Rhopalosiphum* sp.; Oxford Mills, VIII-25-1961, aquatic plants.

Hosts.—*Phaenoglyphis ambrosiae* has been associated by rearing from numerous hosts, primarily in Southern California. They have been associated with six genera and 16 species of aphids in the tribes Aphidini and Macrosiphini. Primary parasite associations are with 5 genera and 8 species, with 3 of the 4 subfamilies represented (Mackauer, 1969). Table 4 lists known host associations for this species.

The most common association is with *Lysiphlebus testaceipes* (Cresson) in association with 6 aphid species. There were no associations with *Aphelinus* species. Some degree of host specificity is indicated by field observation and rearings in the Box Springs Mountains in Riverside, California. Heavy *Dactynotus ambrosiae* (Thomas) infestations on *Artemisia douglasiana* Bess. in Hook. were heavily parasitized by *Lysiphlebus testaceipes* (Cresson), which had a moderate *Phaenoglyphis*

TABLE 4. Known host associations of *Phaenoglyphis ambrosiae* (Ashmead).

Aphid subfamily—Aphid host—Plant host	*Primary parasite*
APHIDINAE	
Rhopalosiphum rufomaculatum (Wilson)	
Chrysanthemum sp.	*Lysiphlebus testaceipes* (Cresson)
Malcomia maritima R.Br.	*Diaretiella rapae* (M'Intosh)
Rhopalosiphum padi (L.)	*Lysiphlebus testaceipes* (Cresson)
Avena sp.	*Ephedrus* sp.
Rhoplosiphum sp.	
Scirpus sp.	?
Aphis fabae Scopoli	
Rumex cripus L.	?
Aphis gossypii Glover	
Crassula sp.	Aphidiinae
Hibiscus sp.	*Lysiphlebus testaceipes* (Cresson)
Mesembryanthemum sp.	*Lysiphlebus testaceipes* (Cresson)
Aphis helianthi Monell	
Rumex crispus L.	?
Aphis pseudohederae Theobald	
Hedera helix L.	*Lysiphlebus testaceipes* (Cresson)
Aphis sp.	
Chrysanthemum frutescens L.	Aphidiinae
Myzus persicae (Sulzer)	
Vinca minor L.	Aphidiinae
Vinca minor L.	*Aphidius nigriteleus* Smith
Solanum tuberosus L.	?
Mirabilis laevis (Benth.)	*Lysiphlebus testaceipes* (Cresson)
Lycopersicon esculentum Mill.	*Diaeretiella rapae* (M'Intosh)
Nasturtium sp.	*Aphidius matricariae* Holiday
DACTYNOTINAE	
Macrosiphoniella ludoviciana (Oestlund)	
Artemesia douglasiana Bess. in Hook	*Aphidius confusus* Ashmead
Artemesia douglasiana Bess. in Hook	*Aphidius* sp.
Dactynotus ambrosiae (Thomas)	
Artemisia dracunculus L.	*Lysiphlebus testaceipes* (Cresson)
Abelia gaucheri	?
Macrosiphum euphorbiae (Thomas)	
Rosa sp.	Aphidiinae
Macrosiphum pteridis Wilson	
Pteridium sp.	*Aphidius* sp.
Macrosiphum rosae (L.)	
Rosa sp.	*Praon unicum* Smith
Rosa sp.	*Praon occidentale* Baker
Rosa sp.	*Praon* sp.
Rosa sp.	*Aphidius alius* Muesebeck
Acyrthosiphon pisum (Harris)	
?	?

ambrosiae (Ashmead) hyperparasitization. Two other plants with apparently suitable hosts (*Encelia farinosa* (Gray)/*Dactynotus katonkae* (Hottes)/*Aphidius* sp., and *Salvia melifera* (Greene)/*Aphis gossypii* (Glover)/*Lysiphlebus testaceipes* (Cresson)) were not parasitized by *P. ambrosiae;* this in spite of the fact that *Aphis gossypii* (Glover)/*Lysiphlebus testaceipes* (Cresson) is a recorded host association on *Mesembryanthemum* and *Hibiscus* and that the *Encelia farinosa* (Gray)/*Dactynotus Katonkae* (Hottes)/*Aphidius* sp. complex was being used by *P. americana.*

Geographic range.—Southern California, Southwestern British Columbia, Southeastern Alberta, extreme Southeastern Canada and New England.

Discussion.—This species is distinguishable from all other Nearctic *Phaenoglyphis* by its open radial cell, straight third antennal segment in the male, deep cylindrical scutellar pits and unfurrowed mesoscutum. I have two specimens collected by H. H. Evenhuis at Wagenhagen, Netherlands, that differ only in having a slightly more elongate radial cell. A careful search of European literature and types has not shown a name that would apply to them.

The sex ratio of specimens examined shows 155 females and 3 males (males present in 2 of 63 collections). A malaise trap set and operated for 5 weeks in an area where *P. ambrosiae* was known to occur yielded only females, and rearing of approximately 30 specimens from *Artemesia* sp./*Macrosiphum* sp. over a two-month period yielded only females. Haviland (1921) states that *Phaenoglyphis curvata* (Kieffer) from England is parthenogenetic, and I think it is likely that *ambrosiae* is also parthenogenetic. Dissection of *ambrosiae* showed that the female lacked a spermatheca, while dissection showed that *P. calverti* and *P. americana* had a spermatheca. The sex ratios of the latter two species are approximately 1:1 (half males and half females). It is possible that the presence or absence of a spermatheca may be an indicator of whether a species or specimen will reproduce asexually.

PHAENOGLYPHIS AMERICANA BAKER

(Figs. 8, 10, 21, 42, 45, 54)

Phaenoglyphis americana Baker, 1896:131; Meusebeck, et al, 1961:608.

Adult female.—Head (excluding mouthparts, gena below eye and antennae), pronotum, mesoscutum, scutellum, mesopleuron, metanotum, propodeum, metapleuron, abdomen reddish-brown. Clypeus, mandibles (except reddish tips), maxilla, labium, legs honey yellow. Wing veins reddish-yellow.

Head as wide as long; frons, clypeus, gena below eye clothed with fine,

silken setae; vertex, remainder of gena with scattered setae. Antennae 13 segmented, subequal to body length; segments 1–4 smooth, 5–13 ridged, moderately clothed with short, semierect setae; segments 3, 4, 5 in ratio of 28:21:21 (28 = 0.14 mm) (Fig. 54); segment 3 cylindrical, segments 4 and 5 sub-cylindrical. Pronotum opaque; densely clothed with appressed, posteriorly directed setae. Mesoscutum smooth, shining; lightly impressed longitudinal furrows from base to middle, occasionally with faint impression extending to anterior margin; scattered setae anteriorly, along longitudinal grooves. Wing transparent, ciliated, longer than body by ratio of 90:80. Radial cell closed; length 2.6 times width (Fig. 42); ratio of wing width to radial cell length and width to wing width 1.8 and 4.7, respectively. Scutellum anteriorly with two kidney-shaped pits forming crescent-shaped depression; dorsum opaquely glabrous; laterally and posteriorly with long, curved setae converging toward midline. Mesopleuron smooth, shining; bisected by distinct transverse suture; triangle depressed, densely clothed with fine silky-grey setae. Metanotum, propodeum, metapleuron densely pubsecent. Adbomen smooth, shining; dense setal ring at base. Body length, 1.5 mm.

Adult male.—As in female except antennae 14 segmented; segment 3 distinctly bowed; segments 3, 4, 5 in ratio of 32:18:19 (32 = 0.16 mm) (Fig. 45). Radial cell slightly longer, length 2.8 times width; ratio of wing width to radial cell length and width 1.7 and 4.7 respectively.

Types.—Holotype, female, labeled "Colo., 1391"; description by Baker, 1896 lists Fort Collins, May. Type in USNM. Allotype, male, same data, deposited in Cornell University Museum.

Specimens examined.—(34 males, 79 females) ALASKA: Cape Thompson, VII-25-1961; Umiat, VII-16-1959. ALBERTA: Elkwater Lake, VII-20-1956; Obed, VII-26-1939; Lethbridge, VI-14-1938; VI-21-1956. BRITISH COLUMBIA: Diamond Head Trail, Caribaldi Park, VIII-13-1953; 4600 ft., VIII-25-1953; Laird Hot Springs, VII-9-1959; Mission City, VI-6-1953; Robson, V-8-1947; Squamish, VII-16-1953; VII-23-1953; VII-26-1953; VII-28-1953; Summerland, IX-17-1958; Terrace, VI-8-1960. CALIFORNIA: Alameda Co.: Albany, X-18-1965, *Medicago sativa/Acyrthosiphon pisum/Aphidius smithi;* San Diego Co.: Fallbrook, I-3-1962, *Stephanomeria exigus/Dactynotus bonitum;* Los Angeles Co.: Los Angeles, Whittier, V-15-1911, *Rosa* sp./*Macrosiphum rosae/Ephedrus* sp.; Riverside Co.: Riverside, XI-19-1957, *Abelia gaucheri/ Dactynotus ambrosiae/ Praon unicus;* III-21-1958, *Rosa* sp./ *Macrosiphum rosae/ Aphidius* sp.; IV-30-1959, *Calendula officinalis/ Dactynotus rudbeckiae/ Aphidius confusus;* IV-8-1960, *Encelia actoni/ Dactynotus katonkae/ Aphidus confusus;* III-6-1961, *Rumex crispus/ Aphis* sp.; II-28-1961, *Encelia farinosa/ Dactynotus katonkae/ Aphidius* sp.; III-21-1958, *Rosa* sp/*Macrosiphum rosae/Aphidius alius; I-24-1966, Encelia farinosa/Dactynotus katonkae/Ephedrus* sp; II-27-1966, *Encelia farinosa/Dactynotus katonkae/Aphidius* sp.; II-28-1966, *En-*

celia farinosa/Dactynotus katonkae/Ephedrus sp.; III-6-1966, *Encelia farinosa/Dactynotus katonkae/Ephedrus* sp.; II-11-1967, *Encelia farinosa/Dactynotus Katonkae/Aphidius* sp.; Temecula Canyon, V-18-1968, *Ambrosiae* sp./ *Ephedrus* sp.; Tucolota Creek, 5 mi, W. Sage, VII-1-1963, *Artemisia* sp./Aphidiinae; Wheeler Hot Springs, *Baccharis* sp./*Dactynotus ambrosiae/*Aphidiinae; Whitewater, XI-11-1944 (A. L. Melander, MCZ). San Bernardino Co.: Highland Valley, III-24-1960, *Nasturtium* sp./*Aphis fabae.* San Diego Co.: La Jolla, III-24-1923, *Aphis* sp. Ventura Co.: Oxnard, VIII-5-1958, *Lupinus* sp./*Macrosiphum albifrons/Aphidius pisivorus.* COLORADO: Fort Collins (from literature, insects labeled only Colo.). MANITOBA: 5 mi. SW Shilo, VIII-2-1958; VII-22-1958. MARYLAND: Montgomery Co.: Cabin John, IX-29-1917. ONTARIO. Ottawa, XI-14-1935, Golden glow/*Dactynotus rudebeckiae;* VI-24-1958. QUEBEC: Chimo, VIII-17-18-1959; Wrightville, VIII-11-26. NEW BRUNSWICK: 5 mi. W. Norgate, VIII-16-1958; Pokiok, VIII-4-1950, Raspberry/*Macrosiphum rubicola.* NORTHWEST TERRITORY: Cameron Bay, Great Bear Lake, VIII-9-1937; Aldershot, VIII-18-1950, Apple. UTAH: Salt Lake Co.: Salt Lake, VIII-7-1913.

Geographic range.—Western North America, including Alaska, Northwest Territory, British Columbia, Alberta, California, Utah and Colorado; Manitoba, New England; Southeast Canada.

Hosts.—This species has been associated by rearing from 4 genera and 9 species of aphids, and 3 genera and 6 species of primary parasites, these records primarily from Southern California (Table 5). *Phaenoglyphis ambrosiae* also has been reared from numerous hosts in the same geographic area and habitats. The same aphid tribes (Aphidini and Macrosiphini) were host associated but the Macrosiphini were almost exclusively used by *americana,* while species from the Macrosiphini and Aphidini were used in equal numbers by *ambrosiae. Phaenoglyphis americana* is a larger species than *ambrosiae* and utilizes larger aphids. The pattern of primary parasite associations seem to be similar to the larger parasites used by *americana and the smaller by ambrosiae.* As in *ambrosiae,* species within the three available aphid subfamilies (Ephedrinae, Prainae and Aphidiinae) were utilized as hosts. Major differences were the absence of any association with *Lysiphlebus testaceipes* (Cresson) by *americana,* which was the most common association of *ambrosiae,* and a large number of associations with *Aphidius* sp. which was not commonly used by *ambrosiae.*

Discussion.—This species can be distinguished by the following combination of characters: longitudinal furrows on mesoscutum, crescent-shaped depression formed by scutellar pits, and by the antennae being longer than the body. It is the most widespread *Phaenoglyphis* species, but shows little variability.

TABLE 5. Known host associations of *Phaenoglyphis americana* (Baker).

Aphid subfamily—Aphid host—Plant host	*Primary parasite*
APHIDINAE	
Aphis fabae Scopoli	
Nasturtium sp.	*Aphidius* sp.
Aphis sp.	
Rumex crispus L.	?
DACTYNOTINAE	
Amphorophora rubicola (Oestlund)	
Ribes sp.	Aphidiinae
Dactynotus ambrosiae (Thomas)	
Abelia gaucheri	*Praon unicum* Smith
Baccharis sp.	Aphidiinae
Dactynotus bonitum (Hottes)	
Stephanomera exigua Nutt.	Aphidiinae
Dactynotus rudbeckiae (Fitch)	
Calendula officinalis L.	*Aphidius confusus* Ashmead
Dactynotus katonkae (Hottes)	
Encelia farinosa Gray	*Ephedrus* sp.
Ambrosiae sp.	*Ephedrus* sp.
Encelia farinosa Gray	*Aphidius* sp.
Encelia actoni (Elmer) Keck	*Aphidius confusus* Ashmead
Acyrthosiphon pisum (Harris)	
Medicago sativa L.	*Aphidius smithi* Sharma & Subba Rao
Macrosiphum albifrons Essig	
Lupinus sp.	*Aphidius pisivorus* Sm.
Macrosiphum rosae (L.)	
Rosa sp.	*Aphidius* sp.
Rosa sp.	*Aphidius alius* Muesebeck

PHAENOGLYPHIS CALVERTI, NEW SPECIES
(Figs. 20, 38, 47, 51)

Adult female.—Head (except mouthparts), pronotum, mesoscutum, scutellum, mesopleuron, metapleuron, propodeum and abdomen shiny dark brownish-black. Mandibles (except reddish tips), maxilla and labium yellow. Antennal segment 1 reddish-yellow; segments 2–4 mottled yellowish-brown; 5–13 dark brown. Wing veins pale lemon yellow. Coxa, legs honey yellow, with proximal infuscation.

Head slightly wider than long; setae pale, short, dense on frons, long, sparse on gena; absent above level of antennal insertion anteriorly and posteriorly, except for scattered few on vertex. Antennae 13 segmented, equal to body length; segments 1–4 smooth, 5–13 ridged; 3, 4, 5 in ratio of 47:40:40 (47 = 0.12 mm) (Fig. 51); terminal segment long. Prono-

tum densely clothed with long, pale decumbent setae. Mesoscutum with few long appressed setae on anterior one-third; posterior two-thirds glabrous; without longitudinal grooves. Wing transparent, ciliated, exceeding abdomen by ratio of 8:6. Radial cell closed; length 3 times width (Fig. 38). Width of wing to radial cell length and width in ratio of 1.7 and 5.0, respectively. Scutellum slightly wider than long; anteriorly with two deep circular pits; posteriorly with long, marginal setae converging toward midline. Mesopleuron shiny, glabrous; transverse furrow distinct; triangle densely pubescent. Metanotum, propodeum and metapleuron densely clothed with pale, curved setae. Body length 1.0 mm.

Adult male.—As female except antennae 14 segmented, third segment distinctly bowed; segments 3, 4, 5 in ratio of 37:30:32 (37 = 0.09 mm) (Fig. 47). Radial cell length 3.4 times width. Ratio of wing width to radial cell length and width 1.4 and 4.8, respectively. Length 0.9 mm.

Types.—Holotype, female, Albany, Alameda Co., California, IV-21-1968, *Graminaea/Sitobion fragariae/monoctonus paulensis* (D. Calvert, UCB). Allotype, male, same data. The holotype and allotype will be deposited in the United States National Museum.

Paratypes: CALIFORNIA: Alameda Co.: Albany, 3 males, IV-21-1968, Graminaea/*Sitobion fragariae/Monoctonus paulensis* (D. Calvert, UCB); Contra Costa Co.: El Cerrito Creek, El Cerrito, 2 females, V-22-1969, Graminaea/*Sitobion fragariae/Monoctonus paulensis* (D. Calvert, UCB).

Host.—Known only from the single association of Graminaea/*Sitobion fragariae* (Theobald)/*Monoctonus paulensis* (Ashmead).

Geographic range.—San Francisco bay area of California.

Discussion.—This species can be distinguished from other *Phaenoglyphis* by the presence of deep circular scutellar pits and lack of furrows on the mesoscutum. It is named for my colleague Donald Calvert, who has made many collections of aphid parasite material.

PHAENOGLYPHIS FALCATA, NEW SPECIES
(Figs. 22, 39, 48, 56)

Adult female.—Head (except mouthparts), shiny chestnut. Pronotum, mesoscutum, scutellum, mesopleuron, metanotum, propodeum and metapleuron shiny brownish black. Antennal segments 1–4 honey yellow, 5–13 reddish-brown. Wing veins light yellow. Legs, coxae, mandibles (except brown tips), maxillae and labium brownish-yellow.

Head slightly wider than high. Head setae pale, dense, erect on frons; slightly longer, directed ventrally on clypeus; long, curved on gena; absent anteriorly and posteriorly above level of antennal insertion. Antennae 13 segmented, slightly longer than body; clothed with stiff, erect setae throughout, sparse on segments 1, 2; segments 3, 4, 5 in ratio of

28:25:25 (28 = 0.14 mm) (Fig. 56). Pronotum densely pilose. Mesoscutum without longitudinal grooves; sparsely setose anteriorly, laterally; distinct line of setae lying where longitudinal grooves would be. Wing exceeding abdomen by length of body; transparent, ciliated. Radial cell closed; length 2.8 times width (Fig. 39); ratio of wing width to radial cell length and width 1.6 and 4.6, respectively. Scutellum short; two round, shallow pits anteriorly; densely clothed with erect, hamulate setae posterior to pits. Mesopleuron smooth, glabrous, bisected by distinct transverse furrow; triangle equilateral, with fine, erect setae. Metanotum, propodeum, metapleuron covered with pale recumbent setae. Mesocoxa, metacoxa clothed with long, straight setae. Body length 1.5 mm.

Adult male.—As female, except 14 segmented antennae, third segment distinctly bowed, segments 3, 4, 5 in ratio of 39:30:30 (39 = 0.14 mm) (Fig. 48); radial cell length 3.4 times width; ratio of wing width to radial cell length and width 1.4 and 4.8 respectively.

Holotype.—Female, George Creek, 4 mi. E. St. Marys Lake, British Columbia, Canada, VII-9-1966, sweeping (F. G. Andrews, UCR). To be deposited in USNM.

Paratypes.—1 female, Diamond Head Trail, Garibaldi Park, British Columbia, 4600 ft., VIII-25-1953 (W. R. M. Mason, CNC); 1 male, 1 female Lethbridge, Alberta, VIII-5-1956 (O. Peck, CNC); McGillivary Creek, nr. Chiliwack, British Columbia, VII-15-1953 (W. R. M. Mason, CNC); 1 female, Vancouver, British Columbia, IX-1951 (J. H. McLeod, CNC).

Host.—Unknown.

Geographic distribution.—Known only from Southwestern Canada.

PHAENOGLYPHIS GUTIERREZI, NEW SPECIES
(Figs. 20, 43, 49)

Adult female.—Head (excluding mouthparts), pronotum, mesoscutum, scutellum, mesopleuron, metanotum, propodeum, metapleuron, abdomen dark chocolate-black. Antennal segments 1–4, maxillae, labium, legs (except for infuscated coxa and femur), honey yellow; 5–13 reddish-brown. Wing veins pale lemon yellow.

Head shining; frons clothed with semierect, pale setae, occiput, postgena with long, procumbent setae extending forward over gena and vertex; gena, vertex glabrous. Antennae to body ratio 58:70; clothed with erect setae, sparse on 1–3; segments 1–4 smooth, 5–13 lightly ridged; segments 3, 4, 5 in ration of 30:19:20 (30 = 0.11 mm) (Fig. 49). Pronotum densely clothed with recumbent setae. Mesoscutum with deep longitudinal grooves extending from base to middle; setae absent anteriorly between projection of longitudinal grooves forward, dense laterally, extending to middle, with narrow band laterally to base. Wing transpar-

ent, ciliated, longer than body by ratio of 90:70. Radial cell closed; length 2.8 times width (Fig. 43); ratio of wing width to radial cell length and width 1.8 and 5.1 respectively. Scutellum with two distinct tooth-shaped pits at base, forming crescent-shaped depression; dorsally glabrous anterior to pits; laterally clothed with long, erect, curved setae. Mesopleuron bisected by distinct transverse suture; glabrous; triangle equilateral, densely pubescent. Abdomen glabrous except for ring of loose curvate setae at base. Body length 1.3 mm.

Adult male.—Unknown.

Types.—Holotype, female, and 5 paratype females; 16 mi. SE Bozeman, Park Co., Montana, flying about flower head of Umbelliferae (F. G. Andrews, UCR). Male unknown. Holotype is to be deposited in the United States National Museum.

Other specimens examined.—(3 females) BRITISH COLUMBIA: Terrace, VII-3-1960. SASKATCHEWAN: Beaver Lake, nr. Flin Flon, VIII-16-1959; Yorkton, IX-15-1959.

Host.—Unknown. Specimens collected near Bozeman, Montana were on the flower heads of an unidentified Umbelliferae; the adults were apparently feeding on the nectar of the flowers. No aphids were observed.

Georgraphic distribution.—Montana, Northern British Columbia and Saskatchewan.

Distribution.—This species can be distinguished from other *Phaenoglyphis* by the short, somewhat clavate antennae, shallow scutellar pits, and the distinctly impressed mesoscutellar furrows. This species is named for my colleague Andrew P. Guttierez, who has made many collections of aphid parasite material.

PHAENOGLYPHIS LAEVIS, NEW SPECIES
(Figs. 20, 41, 50)

Adult female.—Vertex, occiput, mesoscutum, scutellum, abdomen chestnut brown. Frons, pronotum, mesopleuron, metapleuron, metanotum, propodeum reddish-brown. Antennal segments 5–13 grey-brown. Antennal segments 1–5, labrum, labium, mandibles (except reddish tips), maxillae, coxae, trocanters, legs, wing veins pale yellow.

Head slightly wider than long. Setae on head short, recumbent; dense on frons, sparse on gena, absent anteriorly and posteriorly on head above antennal insertion. Antennae longer than body, 13 segmented, filamentous; segments 1–4 smooth, 5–6 lightly ridged, 7–13 heavily ridged; all with semierect stout setae, sparse on segments 1, 2; segments 3, 4, 5 in ratio of 45:40:40 (45 = 0.24 mm) (Fig. 50). Pronotum unsculptured, densely setose over entirety. Mesoscutum unsculptured, without longitudinal grooves; setae long, decumbent, sparse on anterior one-third, poste-

rior two-thirds with short decumbent setae along lateral margin. Wing long, exceeding abdomen by length of body, transparent, ciliated. Radial cell closed; length 3.2 times width (Fig. 41); ratio of wing width to radial cell length and width 1.6 and 5.2, respectively. Scutellum without pits anteriorly; laterally, posteriorly with long, dense, decumbent setae. Mesopleuron smooth, shining, without setae; bisected by distinct transverse furrow; mesopleural triangle densely pubescent, equilateral. Metanotum, propodeum and metapleuron densely clothed with long, curved setae. Body length 1.5 mm.

Adult male.—Unknown.

Types.—Holotype, female, CANADA: Johnston Canyon, 4700 ft., Banff, Alberta, VIII-18-1962 (K. C. Hermann, CNC). Type in Canadian National Collection. Male unknown.

Paratypes.—BRITISH COLUMBIA: Squamish, Diamond Head Trail, 4600 ft., 1 female, VIII-29-1953 (W. R. M. Mason, CNC).

Host.—Unknown.

Geographic range.—This species is known only from two locations in mountainous areas of British Columbia and Alberta.

Discussion.—This very distinctive species is easily differentiated from other *Phaenoglyphis* by the lack of scutellar pits. Overall appearance is very much like several *Alloxysta* species, from which it differs only in the present of the mesopleural suture.

PHAENOGLYPHIS PECKI, NEW SPECIES
(Figs. 22, 35, 52)

Adult female.—Head (excluding frons, mouthparts), pronotum, mesoscutum, scutellum, mesopleuron, metanotum, propodeum, metapleuron, abdomen chestnut. Frons honey yellow. Antennal segments 1–5, mouthparts, legs, coxae pale lemon yellow. Antennal segments 6–13 yellowish brown.

Head slightly longer than wide. Head setae pale, short; dense, stiff on frons; remainder of head glabrous, except for few scattered setae at base of gena and vertex. Filiform, segments 5–13 slightly heavier than segments 1–4; segments 1–4 smooth, sparsely pubescent; segments 5–13 heavily ridged, clothed with erect, heavy setae; segments 3, 4, 5 in ratio of 17:16:20 (17 = 0.085 mm) (Fig. 52). Pronotum densely clothed with procumbent setae. Mesoscutum without longitudinal grooves, smooth, glabrous. Wing longer than body by ratio of 8:6; transparent; ciliated. Radial cell closed, anterior margin clear, giving impression that cell is open; radial cell length 3.1 times width (Fig. 35); ratio of wing width to radial cell length and width 1.5 and 4.7, respectively. Antennae 13 segmented; longer than body by ratio of 7:6. Scutellum with two deep, round pits at anterior base forming rectangular depression; long, erect

setae along lateral and posterior margin. Mesopleuron bisected by distinct transverse suture; glabrous; triangle finely setose. Metanotum, propodeum and metapleuron densely pubescent. Abdomen anteriorly with dense setal ring; glabrous; shining. Body length 1.1 mm.

Adult male.—Unknown.

Type.—Holotype, female, Chapin Sanctuary, East Ridge, Tennessee, V-7-1952 (O. Peck, CNC). Type in the Canadian National Collection, Ottawa, Canada.

Host.—Unknown.

Geographic distribution.—*Phaenoglyphis pecki* is known only from the type specimen collected in the foothills of the Appalachian Mountains.

Discussion.—Although only one specimen of this species is known, its distinctiveness has led me to describe it. *P. pecki* can be differentiated from all other species (except *Ambrosia*), by the apparently open radial cell. Together *Ambrosia* and *pecki* form a distinct group that differs from other *Phaenoglyphis* by the open radial cell, and the deep circular scutellar pits. In *pecki* the third antennal segment is shorter than the fifth, a character that is unique in the Alloxystinae.

This species is named for its collector, Oswald Peck.

PHAENOGLYPHIS PILOSUS, NEW SPECIES
(Figs. 20, 36, 44, 57)

Adult female.—Head (excluding infuscated vertex), antennae (except basal segment), pleuron, wing veins, anterior portion of mesoscutum, lateral area of scutellum, propodeum, metapleuron, lateral area of abdomen pale orange brown. Posterior half of mesoscutum, scutellar dorsum, dorsal edge of abdomen chestnut brown. Mandibles (except reddish brown tips), mouthparts, basal segment of antennae, legs lemon yellow.

Head slightly wider than long. Head setae pale yellow, short, dense on frons, long, decumbent on gena and occiput, short, sparse on vertex. Antennae longer than body, 13 segmented; segments 1–3 smooth, 4–13 longitudinally ridged, setaceous; segments 3, 4, 5 in ratio of 50:34:34 (50 = 0.19 mm) (Fig. 57). Pronotum covered with fine, dense pale yellow setae. Mesoscutum with deep grooves; densely covered with long decumbent setae. Mesopleuron glabrous, bisected by faint transverse suture. Wings long, exceeding abdomen by its length; transparent; ciliated. Radial cell closed; length 3.1 ± 0.1 times width (Fig. 36). Ratio of wing width to radial cell length and width 1.2 and 3.7, respectively. Scutellum anteriorly with two large crescent-shaped pits; sparsely covered with long, procumbent setae. Body length, 1.7 mm.

Adult male.—As female except entire mesoscutum and most of abdomen dark chestnut brown; gena, pronotum paler. Antennae 14 segment-

ed, third segment distinctly bowed (Fig. 44); segments 3, 4, 5 in ratio of 35:22:22 (35 = 0.21 mm). Radial cell length 3.0–3.2 times width. Ratio of wing width to radial cell length and width 1.4 and 4.2, respectively. Body length, 1.6 mm.

Types.—Holotype, female, Cerrito Creek, El Cerrito, Contra Costa Co., CALIFORNIA, V-22-1969 (D. Calvert, UCB). Allotype, male, Kleanza Creek, 14 mi. E. Terrace, BRITISH COLUMBIA, VII-30-1960 (J. G. Chillcott, CNC). Holotype to be deposited in the United States National Museum and allotype in the Canadian National Collection.

Paratypes.—ALBERTA: Waterton, 1 female, VI-18-1956 (O. Peck, CNC). BRITISH COLUMBIA: Hobson, 1 female, V-18-1949 (H. R. Foxlee, CNC); Kitmat, 1 male, VI-2-1960 (J. C. Chillcott, CNC); Kleanza Creek, 14 mi. E. Terrace, 1 female, 1 male, VI-17-1964 (J. C. Chillcott, CNC); Mt. Thompson, nr. Terrace, 1 male VI-21-1960 (J. C. Chillcott, CNC); Head Port Neville Inlet, 1 female, III-17-1942, *Picea sitechensis* (Bong.) Carr/*Cinera* sp./Aphidiinae (Forest Insect Survey, CNC); Terrace, 1 male, VI-1-1960 (C. H. Mann, CNC). CALIFORNIA: Contra Costa Co.: Cerrito Creek, El Cerrito, 2 females, V-22-1969 (D. Calvert, UCB). COLORADO: Clear Creek Co.: 3 mi. SW Idaho Springs, 1 female, VII-27-1961 (C. H. Mann, CNC); West Chicago Creek, 1 female, VIII-11-1961 (B. H. Poole, CNC). IDAHO: Latah Co.: Moscow Mountains, 1 male, VIII-7-1910 (A. L. Melander, MCZ).

Hosts.—*Picea sitchensis* (Bong.) Carr/*Cinara* sp./Aphidiinae.

Geographic range.—British Columbia, Alberta, Idaho, Colorado, and California.

Discussion.—This very distinctive species is easily differentiated from other nearctic species by its ochraceous color. It is very similar in size, color and specific morphology to the European *P. xanthochroa.* It can be differentiated from *xanthochroa* by the pilosity of the mesoscutum and the extension of the mesoscutal furrows to the middle of the mesoscutum. In *xanthochroa* the mesoscutal furrows are percurrent and the surface glabrous.

PHAENOGLYPHIS STENOS, NEW SPECIES
(Figs. 22, 40, 53)

Adult female.—Head (excluding mouthparts), abdomen dark brown with red tint. Antennal segments 1–3 greyish yellow, 4–13 honey yellow. Clypeus, maxilla, labium orange brown. Pronotum, mesoscutum, metanotum, propodeum, metapleuron chestnut. Wing veins pale yellow. Legs (including coxae), translucent honey yellow, femur medially infuscated.

Head slightly wider than long. Setae on frons short, stiff, sparse; scattered procumbent setae on posterior portion of gena; remainder of

genae, occiput and vertex glabrous. Antennae 13 segmented; one-fourth longer than body; segment 1 lighted ridged; 2–13 distinctly ridged; setae sparse on segments 1–3, dense on 4–13; length of segments 3, 4, 5 in ratio of 30:20:20 (30 = 0.15 mm) (Fig. 53); segment 3 cylindrical, 4 and 5 inflected. Pronotum sparsely clothed with procumbent setae. Mesoscutum with distinct longitudinal grooves extending from base to middle; setae long, procumbent anteriorly and along lateral margin. Wing longer than body by ratio of 11:8; transparent; ciliated. Radial cell closed; length 2.8 times width (Fig. 40); ratio of wing width to radial cell width and length 1.7 and 4.9, respectively. Scutellum with deep, tear-shaped pits anteriorly, sparse semi-erect setae laterally and posteriorly. Mesopleuron bisected by obscure longitudinal groove; glabrous; triangle densely pubescent. Metanotum, propodeum, metapleuron moderately clothed with procumbent setae. Body length 1.0 mm.

Male.—Unknown.

Type.—Holotype, female, Paxon Lodge, Gulkana, Alaska, VIII-4-1951 (W. R. M. Mason, CNC).

Paratype.—Paxon Lodge, Gulkana, Alaska, VII-31-1951 (W. R. M. Mason, CNC). Type and paratype in the Canadian National Collection.

Host.—Unknown.

Geographic range.—Known only from the type locality in Southwest Alaska.

Discussion.—*Phaenoglyphis stenos* is quite similar to *gutierrezi* and *americana,* but can be separated on the basis of antennal characters. The antennae of *stenos* is longer than the body, while in *gutierrezi* it is shorter. *P. americana* and *P. stenos* can be differentiated on the basis of the form of antennal segment 3–5. In *stenos* segment 3 is cylindrical and has a few longitudinal ridges and segments 4 and 5 are expanded, but basely constricted; in *americana* antennal segment 3 is slightly expanded and 4 and 5 are more cylindrical in shape.

ALLOXYSTA FOERSTER

Alloxysta Foerster, 1869:340; Kieffer, 1902:9, Ashmead, 1903:142; Lameere, 1907:194; Rohwer and Fagan, 1917:360; Hellen, 1931:3; 1963:8; Dunn, 1949:106; Muesebeck et al., 1951:607; Weld, 1952:253; Parker, et al., 1953:25; Rosen, 1966:225.

Alloxysta (Alloxysta); Kieffer, 1904:5; Schmiedeknecht, 1907:409; Dalla Torre and Kieffer, 1910:249.

Allotria Westwood, 1833:495; Dahlbom, 1842:1; Hartig, 1843:415; Giraud, 1860:125; Thomson, 1862:406; Taschenberg, 1866:129; Foerster, 1869:340; Marshall, 1870:179; Cameron, 1879:113; 1883:365; 1884:267, (1887) 1886:85; 1887:19; 1889:53; 1890:238; Ashmead,

1885:297; 1903:142; Provancher, 1889:167; Kieffer, 1900:114; Lameere, 1907:194. (Preoccupied by Hubner, 1816.)

Allotria (Allotria) Westwood, 1833; Thomson, 1877:814; Kieffer, 1902:14; Schmiedeknecht, 1907:409.

Cynips Hartig, 1840; Zetterstedt, 1838:407. (Not Linnaeus, 1758.)

Xystus Hartig, 1840:186; 1841:341; Rondani, 1876:83; Ashmead, 1904:76. (Preoccupied by Schoenheer, 1826.)

Synergus Hartig 1839 (1840); Rondani, 1848:8. (Not Hartig, 1839 [1840].)

Dilyta Kieffer, 1900:114; 1904:23; Dalla Torre and Kieffer, 1910:249. (Not Foerster, 1869.)

Dylita Baker, 1896:131. (lapsus for *Dilyta* Foerster.)

Nephycta Foerster, 1869:339; Dalla Torre, 1893:36; Kieffer, 1900:114; 1904:21; Ashmead, 1903:142; Schmiedeknecht, 1907:409; Dalla Torre and Kieffer, 1910:290; Rohwer and Fagan, 1917:371; Weld, 1952:250.

Pezophycta Foerster, 1869:339; Ashmead, 1903:141; Kieffer, 1904:18; Lameere, 1907:194; Schmiedeknecht, 1907:409; Dalla Torre and Kieffer, 1910:291; Rohwer and Fagan, 1917:373; Weld, 1952:250.

Charips Marshall, 1870:181; Cameron, 1879:117; Dalla Torre and Kieffer, 1910:267; Rohwer and Fagan, 1917:363; 1919:238; Weld, 1920:15; 1952:251; 1957:20; Haviland, 1922:321; James, 1928:293; Ullyett, 1938:21; Dunn, 1949:106; Muesebeck et al., 1951:607; George, 1957:619; Shands, 1965:67; Rosen, 1966:225; Al-Azawi, 1966:278; Paetzold and Vater, 1967:1; 1968:409.

Type Species.—*Alloxysta victrix* (Westwood), 1833 described as *Allotria victrix.* (Monobasic.)

Etymology.—*Allo*—Greek = strange or foreign; *xystus*—Greek = porch. Foerster apparently used *Allo-* to mean a "strange" or different "xystus". Hartig utilized "xystus" in reference to the smooth, depressed appearance of the scutellum.

Diagnosis.—The genus *Alloxysta* is readily separable from the Alloxystinae genera. It differs from *Phaenoglyphis* and *Hemicrisis* by lacking mesopleural sutures and from *Lytoxysta* by the absence of the reticulate sculpturing of the body.

What constitutes the genus *Alloxysta* is more of a problem than that of differentiating it from the other genera. Historically, it has been divided into several genera or subgenera on the basis of reduced wing size (*Pezophycta* and *Nephycta*), and whether the radial cell was closed or open (*Charpis* and *Alloxysta*). Little justification can be offered for giving *Pezophycta* or *Nephycta* generic status; they are morphologically identical to other *Alloxysta* in all characters examined except the re-

duced wing. The radial cell is normally formed in the reduced wing of *Pezophycta* and completely obliterated in *Nephycta.*

It is possible that the separation of those species with closed as opposed to open radial cells has some basis. There is not enough known of host associations, but it seems that those species with open radial cells are in many cases boreal and associated with coniferous habitats. Counter to this is the morphology of the two groups; each major structure is found in both groups, i.e., bowed state of antennal segments 3–5 in male, and long, arcuate r-2, or straight, long or short r-2.

The most questionable species included here is *Alloxysta lachni* (Ashmead). It differs in the form of the radial cell, elongate and ridged third antennal segment, and in its lachnini aphid association. It is held in *Alloxysta* at this time because of the paucity of information on its host associations.

Description.—Head usually chestnut to blackish-brown with frons varying from yellow to unicolorus with rest of head; sometimes head may be completely yellow. Antennae have first three to five segments two shades of yellow and the remainder brown, but on occasion all segments totally yellow.

Head wider than long, rarely longer than wide; head usually with densely setose frons and scattered setae on occiput and gena; vertex glabrous; on occasion entire head may have scattered setae, and any area except frons may be glabrous. Antennae 13 segmented in female, 14 segmented in male; scape enlarged and elongate; pedicle enlarged and usually almost as wide as long; flagellum usually composed of segments 3–5, but may be reduced to segments 3 and 4 and in several males may not be differentiated; segments 4, 4–5 or 3, 4, 5 may be bowed in male, 3 never bowed if 4 and 5 are straight; segments 3–5 variable in length with length decreasing distally; segments 6–13 or 14 incrassate with longitudinal ridges and forming weak club; on occasion segment 5 may be included; segments usually moderately clothed with sparse erect setae. Pronotum expanding laterally to triangular shape, usually shiny and densely setose, but may be glabrous in total or on upper margin. Mesoscutum convex, oval to round when viewed from above and with varying amounts of scattered setae; never with longitudinal sutures. Wings usually large and with well-formed radial cell, several European species have wings aborted and radial cell obsolete; always with dense setal covering. Radial cell when present may be closed or open on costal margin; this opening may be complete or partial; subcosta always present and with three sections; basal cross vein and second intercubitus always present; cubitus may be present or absent, if present, always faint. Scutellum without pits, constriction varying so as to give disc circular to oval dorsal form. Mesopleuron rectangular, triangle setose, remainder convex to flat and shining glabrous. Metapleuron an elongate triangle that usually is distinctly separated from propodeum, but may be continuous with it;

together they are always partially to completely covered with dense setal mat.

Distribution.—This genus is the most widespread of the Alloxystinae and contains most of the described species. It is found in North America, South America, Europe, Africa, Asia and Australia.

THE *ALLOXYSTA MEGOURAE* (ASHMEAD) COMPLEX (Figs. 112, 113, 114)

This group of extremely similar entities is not considered in this paper. All members of the group run to *"megourae* complex" in the key, but I am not able to state with assurance at this time if the complex is a single, variable species or seven or eight closely related species.

The described entities falling in this complex are *Alloxysta megourae* (Ashmead) and *Alloxysta bakeri* (Kieffer).

KEY TO THE NEARCTIC SPECIES OF ALLOXYSTA *

Antennae 13-segmented ..... females
Antennae 14-segmented ..... males

FEMALES

1. Radial cell open on costal margin 2
   Radial cell closed 12
2. Vein r-2 with pronounced angulation just before reaching costal margin (Fig. 67); radial cell short, 2.1 times longer than wide .... *schlingeri* n. sp.
3. Antennal segment 3 shorter than antennal segment 4 (Figs. 72 & 86) 4
   Antennal segment 3 longer than antennal segment 4 5
4. Antennal segment 3 subequal to antennal segment 5 .... *coniferensis* n. sp.
   Antennal segment distinctly shorter than antennal segment 5..... ..... *filimentosus* n. sp.
5. Length of radial cell more than 3 times its width (Fig. 61) .... *bicolor* (Baker)
   Length of radial cell less than 2.8 times its width..... 6
6. Antennal segments 4 and 5 of equal length, 3rd segment 1.4 times longer than 4th or 5th ..... *anthracina* n. sp.
   Antennal segments not as above 7

* Female *A. vandenboschi,* and male *A. filimentosus* and *A. quebeci* are unknown.

7. Antennal segments 3 and 4 subequal in length, individually longer than segment 5 8
Antennal segments 3 and 4 not of same length; segment 4 subequal to segment 5 9

8. Radial cell length 2.7 ± .1 times its width, r-2 angulate near middle (Fig. 76); antennae stout (Fig. 78) ..... *miniscula* n. sp.
Radial cell length 2.4 ± .1 times its width, r-2 evenly arcuate (Fig. 64); antennae less stout (Fig. 66) ..... *alaskensis* Ashmead

9. Vein r-2 1.4 times the length of r-1 (Fig. 87) ..... *quebeci* n. sp.
Vein r-2 at least 1.7 times the length of r-1 10

10. Antennal segments 3, 4, 5 subequal in length (Fig. 75) ..... *commensuratus* n. sp.
Antennal segments 3, 4, 5 not subequal 11

11. Antennal segments 1–5 yellow and smooth (Fig. 81); wing narrow ..... *halli* n. sp.
Antennal segments 1–3 yellow and smooth, segments 4 and 5 darker and longitudinally ridged (Fig. 60): wing wider .. *affinis* (Baker)

12. Antennal segment 3 longer than segments 4 or 5 by 1.7 times or more; antennal segments 4 and 5 distinctly longitudinally ridged ..... *lachni* (Ashmead)
Antennal segment 3 not more than 1.4 times longer than segment 4 or 5; antennal segments 3–5 smooth 13

13. Antennal segment 5 longer than either antennal segment 3 or 4 and distinctly expanded; r-2 only 1.3 ± .1 times longer than r-1 ..... *xanthopsis* (Ashmead)
Antennal segment 5 not longer than either antennal segments 3 or 4, and not distinctly expanded; r-2 at least 1.9 ± .1 times longer than r-1 14

14. Radial cell large, ratio of wing width to radial cell width 5:1; radial cell 2.6 or more times longer than wide 15
Radial cell small, ratio of wing width to radial cell width 6:1; radial cell 2.4 times, or less, longer than wide 16

15. Antennal segment 3, 6 times longer than wide; head yellow ..... *victrix* (Westwood)
Antennal segment 3, 4 times longer than wide; head brown ..... *brassicae* (Ashmead)

16. Length of antennal segment 3, 4 times its width .. *dicksoni* n. sp.
Length of antennal segment 3 less than 3 times its width 17

17. Segments 8–13 forming a distinct club which gradually expands to maximum width at segment 12 ..... *rauchi* n. sp.
Segments 8–13 not forming distinct club; segments 6–13 may form a club, but all segments are of same width 18

18. Radial cell apically acute (Fig. 109); r-2 straight; ratio of antennal segments 3, 4, 5, 15:12:11 (see description) .. *leguminosa* (Weld)
Not with above set of characters ..... *megourae* complex

MALES

1. Radial cell open on costal margin 2
Radial cell closed on costal margin 11

2. Antennal segments 4 and 5 bowed 3
Antennal segments 4 and 5 not bowed, 4th may have slight curvature 7

3. Antennal segment 3 distinctly longer than either segment 4 or 5; segments 3, 4, 5 cylindrical basally, but arcuately expanding apically (Fig. 83) ..... *anthracina* n. sp.
Antennal segment 3 not longer than either segment 4 or 5 4

4. Antennal segments 3 and 4 bowed very slightly, segment 5 twice as long as wide (Fig. 77) ..... *minuscula* n. sp.
Antennal segments 3 and 4 strongly bowed, segment 5 more than 3 times longer than wide 5

5. Antennal segments 3, 4, 5 with distinct longitudinal ridges, segments 4 and 5 strongly bowed (Fig. 75); radial cell more elongate and narrower (Fig. 64) ..... *alaskensis* Ashmead
Antennal segments 3, 4, 5 smooth, without longitudinal ridges.. 6

6. Antennal segments 3 and 5 subequal in length; radial cell 2.5 times longer than wide ..... *vandenboschi* n. sp.
Antennal segment 5 longer than antennal segment 3; radial cell 2.9 times longer than wide ..... *coniferensis* n. sp.

7. Vein r-2 distinctly angulate just before reaching costal margin ..... *schlingeri* n. sp.
Vein r-2 evenly arcuate or at most with a slight angulation near median point 8

8. Antennal segments 3, 4, 5 subequal in length, ratio 32:32:31 (Fig. 63) ..... *bicolor* (Baker)
Antennal segments 3, 4, 5 not equal in length, segment 3 longer than either 4 or 5 9

9. Antennal segment 5 with longitudinal ridges; antennal segments not compactly jointed (Fig. 80) ..... *halli* n. sp.
Antennal segment 5 smooth, individual segments compactly jointed 10

10. Antennal segments 1–3 smooth, segments 4–13 longitudinally ridged..... *ruficeps* (Baker)
Antennal segments 1–4 smooth, segments 5–13 longitudinally ridged..... *commensurates* n. sp.

11. Antennal segments 4 and 5 bowed 12
Antennal segments 4 and 5 not bowed, segment 4 may be bowed 14

12. Radial cell short and broad; r-2, 1.3 ± .1 times longer than r-1 (Fig. 104) ..... *xanthopsis* (Ashmead)
Radial cell longer and narrower; r-2, 1.9 ± .1 times longer than r-1 13

13. Head brown; antennal segments 4 and 5 distinctly expanded basally, distinctly bowed ..... *brassicae* (Ashmead)
Head yellow; antennal segments 4 and 5 not expanded at base and less bowed ..... *victrix* (Westwood)

14. Antennal segments 3–5 with longitudinal ridges; antennal segment 3, 1.7 times longer than antennal segment 5 (Fig. 98); r-2 bowed into radial cell ..... *lachni* (Ashmead)
Antennal segments 3–5 smooth; antennal segment 3 less than 1.5 times longer than antennal segment 5; r-2 straight 15

15. Antennal segment 4 distinctly notched (Fig. 102); antennal segments 8–14 expanded to form distinct club ..... *rauchi* n. sp.
Antennal segment 4 not notched, may have very gentle bow but not distinct notch; antennae not distinctly clubbed 16

16. Antennal segment 5 longitudinally ridged; segment 4 narrowed basally, club-shaped..... *dicksoni* n. sp.
Antennal segment 5 smooth, without ridges; antennal segment 4 not club-shaped 17

17. Antennal segments 3–5 subequal in length; r-2 straight. ..... leguminosa (Weld)
Antennal segment 3 distinctly longer than either segment 4 or 5; r-2 usually bowed ..... *megourae* complex

ALLOXYSTA AFFINIS (BAKER)
(Figs. 24, 58, 59, 60)

Dylita affinis Baker, 1896:132.

Alloxysta (Alloxysta) affinis; Dalla Torre and Kieffer, 1902:38; 1910:264.

Alloxysta affinis; Muesebeck et al., 1951:607.

Alloxysta abdominalis Baker, 1896:135; Muesebeck et al., 1951:607. NEW SYNONOMY.

Alloxysta (Alloxysta) abdominalis; Dalla Torre and Kieffer, 1902:38; 1910:266.

Alloxysta apicalis Baker, 1896:135; Muesebeck et al., 1951:608. NEW SYNONOMY.

Alloxysta (Alloxysta) apicalis; Dalla Torre and Kieffer, 1902:38; 1910:265.

Dylita coloradensis Baker, 1896:133. NEW SYNONOMY.

Alloxysta (Alloxysta) coloradensis; Dalla Torre and Kieffer, 1902:38; 1910:264.

Alloxysta coloradensis; Muesebeck et al., 1951:608.

Alloxysta gracilis Baker, 1896:134; Muesebeck et al., 1951:608. NEW SYNONOMY.

Alloxysta (Alloxysta) gracilis; Dalla Torre and Kieffer, 1902:38; Dalla Torre and Kieffer, 1910:265.

Alloxysta magna Baker, 1896:134; Muesebeck et al., 1951:608. NEW SYNONOMY.

Alloxysta (Alloxysta) magna; Dalla Torre and Kieffer, 1902:38; 1910:265.

Dylita ruficeps Baker, 1896:132. NEW SYNONOMY.

Alloxysta (Alloxysta) ruficeps; Dalla Torre and Kieffer, 1902:39; 1910:264.

Alloxysta ruficeps; Muesebeck et al., 1951:608.

Alloxysta rufipleura Baker, 1896:135; Muesebeck et al., 1951:608. NEW SYNONOMY.

Alloxysta (Alloxysta) rufipleura; Dalla Torre and Kieffer, 1902:39; 1910:266.

Dylita similis Baker, 1896:133. NEW SYNONOMY.

Alloxysta (Alloxysta) similis; Dalla Torre and Kieffer, 1902:39; 1910:264

Alloxysta similis; Muesebeck et al., 1951:608.

Adult female.—Head, thorax, abdomen, wing veins dark brown. Antennal segments 2–4, legs honey yellow. Antennal segments 1, 5–13 reddish-brown. In some specimens, frons and genae honey yellow.

Head distinctly wider than high; frons, genae below eye, sparsely clothed with coarse, decumbent setae. Remainder of head glabrous. Antennae 13 segmented, stout, exceeding body as 85:64 (85 = 1.6 mm),

segments 1–3 smooth, 4–13 longitudinally ridged, segments 3, 4, 5 ratio of 38:34:35 (38 = 0.13 mm) (Fig. 60). Pronotum sparsely clothed with fine, decumbent setae. Mesoscutum distinctly convex, anterior one-third, and lateral margins sparsely clothed with long, decumbent setae. Wing of moderate width, exceeding body by 74:64 (74 = 1.4 mm). Radial cell open on costal margin in apical one-half, length 2.8 times width; ratio of wing width to radial cell length and width 1.7 and 5.1, respectively. r-2 evenly arcuate, reaching costal margin where it expands slightly (Fig. 58). Scutellum deeply notched at constriction; glabrous dorsally and posteriorly, few coarse setae laterally. Mesopleuron flat, triangle small, not attaining posterior margin. Metanotum separated from propodeum by distinct suture. Propodeum, metanotum obscured by dense, erect setae. Body length 1.2 mm.

Adult male.—As female, except 14 segmented antennae with segments 3, 4, 5 straight, ratio 32:25:25 (32 = 0.11 mm) Fig. 56); ratio of radial cell width to length 2.9, ratio of wing width to radial cell length and width 1.8 and 5.2, respectively.

Types.—Holotype, female, Fort Collins, Larimer Co., Colorado, September (C. F. Baker, USNM). No paratypes.

Other specimens examined.—(6 females, 3 males) Colorado: Clear Creek Co., Doolittle Ranch, Mt. Evans, 9,600 ft., VII-23-1961; also studied were 8 specimens from Ft. Collins, Larimer Co., Colorado that are USNM holotypes of synonyms as follows:

1 female	June	Holotype, *Dylita ruficeps* Baker
1 female	June	Holotype, *Alloxysta magna* Baker
1 female	June	Holotype, *Alloxysta abdominalis* Baker
1 male	June	Holotype, *Dylita coloradensis* Baker
1 male	June	Holotype, *Alloxysta rufipleura* Baker
1 female	September	Holotype, *Alloxysta gracilis* Baker
1 female	September	Holotype, *Alloxysta apicalis* Baker
1 male	September	Holotype, *Dylita similis* Baker

Host.—Unknown.

Geographic distribution.—Known from two localities in north-central Colorado. The two localities are quite different; Mt. Evans is at an elevation of 2,900 m., while Ft. Collins is a sagebrush area only 1,500 m. in elevation.

Discussion.—This species is quite similar to *Alloxysta anthracina* n. sp., but can be distinguished on the basis of the antennal ratios (*anthracina,* 55:42:39; *assimilis,* 38:34:35) and the less compact and darkly pigmented thorax and abdomen.

ALLOXYSTA ALASKENSIS ASHMEAD
(Figs. 28, 64, 65, 66)

Alloxysta alaskensis Ashmead, 1902:142; Muesebeck et al., 1951:608.

Alloxysta (Alloxysta) alaskensis; Dalla Torre and Kieffer, 1910:266.

Adult female.—Area below antennae and between eyes, mouthparts reddish-orange. Remainder of head, thorax, abdomen reddish-brown, head lighter in color in some specimens. Legs, first 5 antennal segments pale yellow to dark yellow. Antennal segments 6–13 dirty brown.

Head slightly wider than long, frons densely setose, remainder of head glabrous, except for scattered occipital setae. Antennae 13 segmented, subequal to body length; segments 1–5 smooth, 5–13 ridged, segments 3, 4, 5 elongate-cylindrical in ratio of 40:40:35 (40 = 0.14 mm) (Fig. 66), 5 intermediate between 3–5 and 6–13, which form weak club. Pronotum densely setose in its entirety. Mesoscutum with scattered setae in anterior half and along two longitudinal lines. Scutellum smooth, bearing long, curved setae that converge medially, except for narrow dorsal strip. Wings transparent; longer than body by ratio of 124:82; setae short. Radial cell open, moderately elongate, length 2.7 times width (Fig. 64), r-2 smoothly arcuate; ratio of wing width to radial cell length and width 1.9 and 5.0, respectively. Body length 1.5 mm.

Adult male.—As in female, except antennae 14 segmented, only segments 1, 2 without longitudinal ridges, segment 3 partially ridged, segments 4–14 completely ridged; segment 3 straight, cylindrical, segments 4, 5 bowed, expanded distally (Fig. 65); segments 3, 4, 5 in ratio of 34:34:37 (34 = 0.12 mm); ratio of radial cell width to length 2.9; ratio of wing width to radial cell length and width 1.7 and 4.9, respectively.

Types.—Holotype, female, Muir Inlet, St. Paul Island, VIII-6-1899 (A. H. Ashmead, USNM), Cat. No. 5525; 2 female, 2 male paratypes, same data.

Other specimens examined.—(6 females, 6 males) ALASKA: Adak, VII-29-1958; Cape Thompson, VII-23-1961; North Fork Crossing, Mi 43 Peel Highway, 3,500 ft.; Paxton Lodge, Gulkana, VIII-4-1951; Unalaklect, VI-19-1961; Uniat, VIII-7-1958; Umnak, VII-16-20-1958. QUEBEC: Great Whale River, VIII-8-1959.

Host.—Unknown.

Geographic distribution.—This is a widely distributed species in the tundra zone of Alaska and Northern Quebec, including the Aleutian Islands. The Quebec and several Alaskan records occur at almost the same longitude (55°).

Discussion.—This is a very distinctive species because of the narrow, elongate radial cell and the exaggerated bow in the fourth and fifth antennal segments of the male. The morphologically closely allied species *coniferensis* and *vandenboschi* differ from *alaskensis* in having the third antennal segment shorter than the fourth; in *alaskensis* the third and fourth are of the same length.

ALLOXYSTA ANTHRACINA NEW SPECIES
(Figs. 26, 82, 83, 84)

Adult female.—Head, antennal segments 4–13, thorax, wing veins, abdomen dark blackish-brown. Antennal segments 1–3 yellowish-brown. Legs honey yellow, coxae browning toward base.

Head distinctly wider than long, densely setose on frons below antennal insertion, genae sparsely setose, vertex with scattered setae; eyes large, protruding. Antennae 13 segmented, exceeding body as 94:92 (94 = 1.7 mm), segments 1–4 smooth, sparsely setose, segments 5–13 ridged, heavily setose, distal portion of segment 5, segments 6–13 slightly wider than flagellum, forming weak club; segment 3 elongate cylindrical, segments 3, 4, 5 in ratio of 55:42:39 (55 = 0.19 mm) (Fig. 84). Pronotum obscured by dense mat of pale setae. Mesoscutum as long as wide, shiny, with scattered setae laterally and anteriorly. Wing exceeding body as 150:92 (150 = 2.8 mm), setae short along margin. Radial cell open on costal margin in apical three-fourths, r-2 not reaching costal margin, moderate size, length 2.4 times width (Fig. 82), r-2 with slight angle slightly past its mid-point; ratio of wing width to radial cell length and width 2.1 and 5.0, respectively. Scutellum with dense patches of setae behind mesoscutum and before constriction, along lateral margin posterior to constriction. Mesopleuron smooth, glabrous, except dense band of setae along basal margin; triangle strongly depressed, densely clothed with very fine colorless setae. Metapleuron sharply defined by distinct suture. Metanotum, propodeum obscured by dense setal covering. Body length 1.7 mm.

Adult male.—As female, except antennae 14 segmented, 1–5 smooth, 6, 7 apically longitudinally ridged, 8–14 completely longitudinally ridged. Antennal segments 2–5 cylindrical basally, arcuately expanded distally to appear club-shaped, ratio of segments 3, 4, 5; 46:38:35 (46 = 0.16 mm) (Fig. 83). Ratio of radial cell width to length 2.5; ratio of wing width to radial cell length and width 2.1 and 5.4, respectively.

Types.—Holotype, male, Mile 236, Richardson Highway, Alaska, VI-16-1951 (W. R. M. Mason, CNC). Paratypes (2 males, 5 females): ALASKA: 1 female, same data as type; Mile 272, Richardson Highway, 1 female, VII-26-1951 (W. R. M. Mason, CNC); Isabel Pass, Mile 206, Richardson Highway, 2,900 ft., 2 females, VII-18-1962 (P. J. Skitsko, CNC). ALBERTA: Lake Louise, 7,600 ft., 1 male, VII-26-1962 (W. R. M. Mason, CNC). COLORADO: Summit Co., Hoosier Pass, 10,500 ft., 1 female, VII-15-1961 (S. M. Clark, CNC). QUEBEC: Chimo, 1 male, VIII-17-18-1959 (W. R. M. Mason, CNC).

Host.—Unknown.

Geographic distribution.—Known only from mountainous areas of western North America including the Alaska Range in Alaska, and the

Rocky Mountains in Alberta and Colorado, except for a single male from Chimo, Quebec.

Discussion.—This distinctive species can be distinguished from other *Alloxysta* of moderate size with an open radial cell by its compact nature dark coloring and distinctively clubbed antennal segments 3, 4, and 5 Its northern range, and mountainous occurrence indicates its association may be to a lachnini aphid on a conifer; its dark compact body is somewhat similar to the Lachnini associated *Hemicrisis ruficorni* Foerster and *Alloxysta lachni* Ashmead.

ALLOXYSTA BICOLOR (BAKER)

(Figs. 27, 61, 62, 63)

Dylita bicolor Baker, 1896:132.

Alloxysta (Alloxysta) bicolor; Dalla Torre and Kieffer, 1902:38 1910:264.

Alloxysta bicolor; Muesebeck et al., 1951:608.

Alloxysta robusta Baker, 1896:133; Muesebeck et al., 1951:608. NEW SYNONOMY.

Alloxysta (Alloxysta) robusta; Dalla Torre and Kieffer, 1902:39 1910:264.

Adult female.—Head, thorax, abdomen dark shiny brown. Antennal segments 1–4, legs, wing veins pale straw yellow. Antennal segments 5–13 reddish-brown.

Head distinctly wider than long, frons densely setose, occiput with scattered setae dorsally, laterally, remainder of head glabrous. Antennae 13 segmented, moderately stout, exceeding body as 80:72 (80 = 1.5 mm), segments 1–5 smooth, 6–13 longitudinally ridged, segments 3, 4 narrow, cylindrical, 5 expands apically, with 6–13 forms loose club; antennal segments 3, 4, 5 with ratio of 38:33:33 (38 = 0.13 mm) (Fig. 63). Pronotum sparsely setose, shiny. Mesoscutum gently convex, as wide as long, truncately oval, anterior one-third and lateral one-third on both sides with scattered setae. Wing large, exceeding body as 120:72 (120 = 2.2 mm). Radial cell elongate, narrow, open along entire costal margin, length 3.2 times width (Fig. 61), ratio of wing width to radial cell length and width 1.8 and 5.5, respectively, r-2 evenly arcuate, reaching costal margin. Scutellum smooth, shiny, moderately constricted, glabrous dorsally, moderately covered with long procumbent setae laterally and posteriorly. Mesopleuron moderately convex, triangle small, but reaching posterior margin. Metapleuron distinctly separated from propodeum by raised suture. Body length 1.3 mm.

Adult male.—As female except antennae 14 segmented, segments 1–6

smooth, 7–14 longitudinally ridged, segment 3 gently arcuate, segments 3, 5 straight, antennal segments 3, 4, 5 in ratio of 32:32:31 (32 = 0.12 mm) (Fig. 62); radial cell length 3.2 times width (as female), ratio of wing width to radial cell length and width 1.7 and 5.4, respectively, r-2 angulate at mid-point, barely reaching costal margin.

Types.—Holotypes, female, Fort Collins, Larimer Co., Colorado, June (C. F. Baker, USNM). Paratype, female, Fort Collins, Larimer Co., Colorado, June (Holotype of *Alloxysta robusta* Baker, 1896) (C. F. Baker, USNM).

Other specimens examined.—(1 female, 1 male) British Columbia: Squamish, Diamond Head Trail, 4,600 ft., VIII-29-1953, VIII-30-1953.

Host.—Unknown.

Geographic range.—Known only from Colorado and British Columbia.

Discussion.—This distinctive species closely resembles *coniferensis* and *filimentosus* because of the long, narrow radial cell with the second radial sector gently but distinctively arcuate. It can be separated from these species by its third antennal segment length, which, unlike the other two, is longer than the length of the fourth antennal segment.

ALLOXYSTA BRASSICAE (ASHMEAD) NEW COMBINATION

(Figs. 25, 94, 100, 106)

Allotria brassicae Ashmead, 1887:14; Dalla Torre, 1893:30.

Allotria (Allotria) brassicae; Dalla Torre and Kieffer, 1902:41.

Charips (Charips) brassicae; Dalla Torre and Kieffer, 1910:289; Weld 1920:15.

Xystus brassicae; Spencer, 1926;148.

Charips brassicae; Muesebeck et al., 1951:607; Parker, Berry and Guido, 1953:25, 44, 94; Weld, 1957:20.

Adult female.—Head above antennal insertion, antennal segments 4–13, thorax abdomen dark brown. Head below antennal insertion, yellowish-brown. Antennal segments 1–3, wing veins, legs pale yellow.

Head as high as wide; frons densely setose; genae, occiput with scattered setae; vertex glabrous. Antennae 13 segmented, filamentous, segments 1–4 smooth, 5 with several longitudinal ridges, 6–13 completely ridged longitudinally; segments 3, 4, 5 in ratio of 36:29:31 (36 = 0.13 mm) (Fig. 94), cylindrical; segment 3 length four times width, segment 5 expanded, with 6–13 forming poorly defined club. Pronotum with sparsely setose band running along upper one-third from tegulae to behind head, ventral two-thirds on lateral portions obscured by dense

decumbent setae. Mesoscutum distinctly convex, longer than wide, oval, with posterior truncation; moderately setose along lateral margin and anterior one-third. Wing large, exceeding body as 88:55 (88 = 1.6 mm). Radial cell large, elongate, length 2.6 times width (Fig. 106); ratio of wing width to radial cell length and width 2.0 and 5.2, respectively; r-11 with slight inward bow; r-2 slightly arcuate. Scutellum small, oval behind distinct constriction; dorsal portion glabrous except along posterior portion which, along with lateral margin, is densely covered with long, curvate, erect setae. Mesopleuron flat, triangle moderate, not reaching posterior margin, densely setose. Metapleuron, propodeum obscured by dense setal covering. Body length 1.0 mm.

Adult male.—As female, except 14 segmented antennae, segments 1–2 smooth, 3–14 longitudinally ridged, segments 3–5 distinctly bowed, segment 3 basally cylindrical, distally expanded, segments 4, 5 expanded both distally and basally; segments 3, 4, 5 in ratio of 35:32:32 (35 = 0.12 mm) (Fig. 100); radial cell length 2.4 times width, ratio of wing width to radial cell length and width 2.3 and 5.5, respectively.

Types.—Holotype, female, Jacksonville, Duval Co., Florida, June to July (USNM) (Cat. No. 2846 USNM). No paratypes.

Other specimens examined.—(26 males, 58 females) CALIFORNIA: Los Angeles Co.: Los Angeles, IV-1888, *Aphis/Brassica campestris,* V-1888, *Aphid/Brassica oleracea;* Whittier, I-17-1911, *Aphis atriplicis,* February, 1911, *Aphid/Brassica* sp., I-28-1923, *Aphis maidis.* Orange Co.: Brea, V-5-1960, *Chenopodium album/Brachycolus atriplicis/Diaeretiella rapae,* El Toro, XI-4-1965, *Brassica oleracea/Brevicoryne brassicae/Diaeretiella rapae;* Garden Grove, X-21-1908, *Brevicoryne brassicae.* Riverside Co.: Riverside, III-30-1960, *Rosa* sp./*Macrosiphum euphorbiae/Aphidius alius,* IV-16-1960, *Rosa* sp./*Macrosiphum euphorbiae/Aphidius alius,* IV-30-1960, *Chenopodium album/Brachycolus atriplicis/Diaeretiella rapae.* FLORIDA: Duval Co.: Jacksonville. ILLINOIS: McHenry Co.: Algonquin, V-1896. LOUISIANA: East Baton Rouge Parrish: Baton Rouge, V-15-1915, *Aphis brassicae.* MICHIGAN. MANITOBA: Winnipeg, VII-18-1960. MARYLAND: Prince Co.: Bowie, VI-7-1945. NEW MEXICO: Grant Co.: Pinos Altos, Cherry Creek, VI-22-1953. VIRGINIA: Norfolk Co.: Norfolk, I-6-1913, *Myzus persicae.* WASHINGTON, D. C.: XI-19-1885, *Aphis brassicae.* WISCONSIN: Waupace Co.: Waupace, VIII-21-1920, *Macrosiphum solanifolii.*

Hosts.—The associated hosts of this species are generally from a closely related group of aphid hosts and parasites (Table 6). The most numerous rearings are from the myzini aphids *Brevicoryne brassicae* (L.) and *Brachycolus atriplicis* (L.) that were parasitized by *Diaeretiella rapae* (M'Intosh). That it does not have a narrow specificity to this group is shown by several records from *Rosa* sp./*Macrosiphum euphorbiae* (Thomas)/*Aphidius alius* (Muesebeck).

TABLE 6. Known host associations of *Alloxysta brassicae* (Ashmead).

Aphid subfamily—Aphid host—Plant host	*Primary parasite*
Aphidiinae	
Brevicoryne brassicae (L.)	
Brassica campestris L.	?
Brassica oleracea L.	*Diaeretiella rapae* (M'Intosh)
Brachycolus atriplicis (L.)	
Chenopodium album L.	*Diaeretiella rapae* (M'Intosh)
Myzus persicae (Sulzer)	
?	?
Aphis maidis Fitch	
?	?
Dactynotinae	
Macrosiphum euphorbiae (Thomas) *Rosa* sp.	*Aphidius alius* Muesebeck

Geographic distribution.—Known from numerous localities throughout the United States.

Discussion.—This distinctive species can be separated from all other North American species, except *A. victrix* (Westwood) by the moderately large, elongate radial cell and bow in the third through fifth antennal segments in the male. It can be separated from *victrix* by the dark vertex, stouter flagellar segments in the female and the basal expansion of antennal segments 4 and 5 in the male.

I have studied specimens from Argentina associated with *Brassica oleracea* L/*Brevicoryne brassica* (L.) *Diaeretiella rapae* (M'Intosh) that are identical with *A. brassicae.* It is also likely that *Alloxysta ancylocera* (Cameron) is a senior synonym of *brassicae;* it is from the same host association complex in Holland and from the description appears to be identical. A study of the type is necessary to verify the synonymy.

ALLOXYSTA COMMENSURATUS, NEW SPECIES
(Figs. 23, 73, 74, 75)

Adult female.—Head (except frons), thorax, abdomen brown with yellowish cast. Frons dark yellowish brown. Antennal segments 1–4, wing veins, legs yellow. Antennal segments 5–13 brown.

Head distinctly wider than high; frons densely setose, genae, vertex with scattered setae. Antennae 13-segmented, moderately stout, exceeding body as 75:60 (75 = 1.4 mm); segments 1–4 smooth, 5–13 ridged, segments 3, 4, 5 subequal in length, ratio of 25:24:25 (25 = 0.09 mm) (Fig. 80). Pronotum densely clothed with long, fine, decumbent setae. Mesoscutum moderately convex, with scattered setae on lateral margins

and anterior two-thirds. Wing exceeding body as 85:60 (85 = 1.6 mm). Radial cell medium sized, length 2.6 times width, ratio of wing width to radial cell length and width 2.0 and 5.4, respectively; r-2 gently bowed, slightly angulate at midpoint (Fig. 73). Scutellum broad, circular in form past constriction; fine, semi-erect setae throughout. Mesopleuron flat, triangle moderate, not reaching posterior margin. Metapleuron obscure. Metanotum, propodeum, metapleuron reduced behind mesopleuron. Body length 1.1 mm.

Adult male.—As female, except antennae 14-segmented, 1–5 smooth, 6–14 ridged, segments 3, 4, 5 without bow in ratio of 30:26:25 (30 = 0.11 mm) (Fig. 80); ratio of radial cell length to width 2.7 and ratio of wing width to radial cell length and width 2.0 and 5.4, respectively; r-2 almost straight, perceptible angulation at mid-point, reaches costal margin.

Types.—Holotype, male, Bowie, Maryland, VI-7-1945, DDT experiment. 3 paratypes, 1 male and 1 female with same data as holotype and 1 male with VII-2-1945 date. Holotype and paratypes in United States National Museum.

Host.—Unknown.

Geographic range.—Known only from the coastal plain area at Bowie, Maryland.

Discussion.—This species is quite similar to *Alloxysta anthracina* n. sp. but is easily separated from it and all other *Alloxysta* species by having a two-segmented flagellum and a distinct 8-segmented club.

ALLOXYSTA CONIFERENSIS, NEW SPECIES
(Figs. 24, 70, 71, 72)

Adult female.—Head (except mouthparts), thorax, abdomen shiny chestnut brown, pronotum slightly more reddish. Antennal segments 1–4 legs, wing veins honey yellow. Mouthparts, antennal segments 5–13 light reddish-brown.

Head height subequal to width; frons densely setose, genae and lower one-third sparsely setose; remainder of head glabrous. Antennae 13-segmented, filamentous, exceeding body as 94:85 (94 = 1.7 mm), segments 1–5 smooth, elongate, segments 6–13 ridged, segments 3, 4, 5 cylindrical, ratio of 41:47:41 (41 = 0.14 mm) (Fig. 72). Pronotum sparsely setose. Mesoscutum distinctly convex, sparsely setose in anterior one-third, 4 lines of longitudinal setae extending to base in posterior two-thirds. Wing large, exceeding body as 130:85 (130 = 2.4 mm). Radial cell elongate, narrow, length 3.1 times width (Fig. 70); ratio of wing width to radial cell length and width 1.6 and 5.0, respectively; r-2 evenly and gently arcuate, not quite reaching costal margin. Scutellum weakly formed behind, densely clothed with long, straight setae except in anterior mid-dorsal one-third. Mesopleuron distinctly convex, triangle

large, constituting one-third of mesopleural area. Metanotum separated from propodeum by obscure, raised suture. Body length 1.6 mm.

Adult male.—As female, except antennae 14-segmented, 1–5 smooth, 6 partially ridged longitudinally, 7–14 distinctly ridged longitudinally, segment 3 straight, cylindrical, segment 4, 5 strongly bowed, expanded apically, antennal segments 3, 4, 5 ratio 31:36:33 (31 = 0.11 mm) (Fig. 71); ratio of radial cell length to width 2.9 and ratio of wing width to radial cell length and width 1.8 and 5.1, respectively.

Types.—Holotype, male, Gatlinburg, Tennessee, 5900 ft., VI-18-1947 (R. H. Whittaker, USNM). Paratypes (3 males, 4 females), same location as type; 2 males, VI-11-1947; 1 male, 1 female, VI-18-1947; females, VI-29-1947; 1 female, VII-13-1947. Holotype and 5 paratypes in USNM; 2 paratypes in authors collection.

Host.—Swept from a spruce-fir association in Great Smokey Mountain National Park.

Geographic range.—Known only from type locality.

Discussion.—The elongate radial cell and the smoothly arcuate r-2 place this species close to *alaskensis, filimentosus* and *assimilis.* The female's elongate, narrow antennal segments 3–5 separate this species from all but *filimentosus,* from which it can be separated by antennal segments 3 and 5 equal length as opposed to the third being 20% shorter than the fifth. The males are separable by having both the fourth and fifth segments of the antennae longer than the third antennal segment.

ALLOXYSTA DICKSONI, NEW SPECIES
(Figs. 26, 91, 101, 110)

Adult female.—Head, antennal segments 1–3, wing veins, legs yellow. Antennal segments 4–13 brownish yellow. Thorax, abdomen light reddish-brown. Pronotum on occasion yellowish.

Head as wide as high. Frons densely setose, remainder of head glabrous. Antennae 13-segmented, filamentous, exceeding body as 66:58 (66 = 1.2 mm), segments 1–4 smooth, segments 5–13 longitudinally ridged, club not apparent; segments 3, 4, 5 cylindrical, in ratio of 31:26:28 (31 = 1.1 mm) (Fig. 91). Pronotum shining, sparsely setose. Mesoscutum moderately convex, oval with posterior truncation, scattered setae laterally and anteriorly. Wing moderate, exceeding body as 85:58 (85 = 1.6 mm). Radial cell closed, moderate size, length 2.3 times width (Fig. 111); ratio of wing width to radial cell length and width 2.6 and 6.0, respectively; r-1 short, straight, r-2 distinctly angulate just before reaching costal margin. Scutellum with disc oval, covered with erect setae except at dorsal midline. Mesopleuron flat, triangle long on anterior margin, not reaching posterior margin of mesopleuron. Metapleuron separated from propodeum by raised ridge. Body length 1.1 mm.

Adult male.—As female, except 14-segmented antennae with segments 3, 4, 5 in ratio of 26:24:23 (26 = 0.09 mm) (Fig. 101); segment 3 cylindrical, segment 4 greatly narrowed in basal one-fifth, segment 5 slightly expanded distally; ratio of wing width to radial cell length and width 2.5 and 6.1, respectively.

Types.—Holotype, female, Bowie, Maryland, VII-4-1945 (USNM); Paratypes (7 males), same data as types. Holotype and 5 paratypes in USNM; 2 paratypes in authors collection.

Host.—Unknown.

Geographic distribution.—Known only from type locality in Maryland on the eastern coastal plain.

Discussion.—This species at first glance appears to be in the *megourae* complex, but a closer look shows it to have a slightly larger radial cell, narrower and more elongate antennal segment 3–5 and a distinctive club-shaped fourth antennal segment in the male.

This species is named for Dr. R. C. Dickson (UCR) who identified the majority of the host aphids listed in this study.

ALLOXYSTA FILIMENTOSUS, NEW SPECIES
(Figs. 23, 85, 86)

Adult female.—Thorax, abdomen pale reddish-brown. Head yellow with vertex infuscated with reddish-brown. Antennal segments 1–5, wing veins, legs pale yellow. Antennal segments 6–13 brown.

Head slightly wider than long, frons sparsely covered with short semierect setae, genae, vertex with few scattered setae. Antennae 13-segmented, filamentous, exceeding body as 98:85 (98 = 1.8 mm), segments 1–5 smooth, segment 6 longitudinally ridged in apical half as segments 7–13 in entirety; segments 3, 4, 5 slender, cylindrical, in ratio of 42:56:51 (42 = 0.15 mm) (Fig. 86). Pronotum densely setose. Mesoscutum slightly longer than wide, moderately convex, with scattered setae anteriorly, laterally; longitudinal lines extending to base. Wing large, exceeding body as 145:85 (145 = 2.7 mm). Radial cell open along entire costal margin, elongate, length 3.1 times width (Fig. 85); ratio of wing width to radial cell length and width 1.6 and 5.0, respectively, r-2 long and evenly arcuate, not quite reaching costal margin. Scutellum smooth, shiny, oval behind constriction, glabrous dorsally, moderately clothed with long semidecumbent setae laterally, posteriorly. Mesopleuron smooth, shiny, gently convex, triangle moderate, barely reaching posterior margin. Metapleuron indistinctly separated from propodeum. Body length 1.6 mm.

Adult male.—Unknown.

Types.—Known only from holotype female, Moscow Mts., Latah Co., Idaho, VII-7-1910 (A. L. Melander, MCZ).

Host.—Unknown.

Geographic distribution.—Known only from the type locality.

Discussion.—Easily distinguishable from other *Alloxysta* species by its elongate radial cell and 42:56:45 ratio of antennal segments 3–5.

ALLOXYSTA HALLI, NEW SPECIES
(Figs. 26, 79, 80, 81)

Adult female.—Head (except infuscated areas within ocellar triangle), straw yellow. Antennal segments 1–5, mandibles, maxillae, labium, legs, wing veins pale yellow. Antennal segments 6–13 slightly infuscated yellow. Thorax, abdomen reddish-brown; some specimens yellowish.

Head height subequal to head width. Frons densely setose; remainder of head glabrous, except for scattered short setae on occiput behind eyes. Antennae 13-segmented, exceeding body length as 73:58 (73 = 1.34 mm)., segments 1–5 smooth, segments 5–13 more barrel-shaped, ridged, segments 3, 4, 5 in ratio of 33:28:28 (33 = 0.12 mm) (Fig. 81); distinctly filiform. Pronotum glabrous behind head, moderately clothed with setae laterally.

Mesoscutum smooth, with scattered setae in anterior two-thirds. Wing exceeding body as 90:58 (90 = 1.67 mm). Radial cell open on anterior margin, r-2 gently bowed, length 2.5 times width (Fig. 79); ratio of wing width to radial cell length and width 2.2 and 6.6, respectively. Mesopleuron subrectangular, posterior dorsal area reaching rear wing attachment; mesopleural triangle small, densely pubescent. Metanotum, propodeum, metapleuron moderately developed, densely pubescent. Body length 1.08 mm.

Adult male.—As female except radial cell shorter; length 2.3 times width, ratio of wing width to radial cell length and width 2.3 and 5.1 respectively. Antennal segments 1–4 smooth, 5 lightly ridged, 6–13 normally ridged. Antennal segments 3, 4, 5 in ratio of 31:27:27 (31 = 0.11 mm) (Fig. 80); segment 4 may have slight bow, 4, 5 may have a distinct but gentle bow.

Types.—Holotype female, and 11 paratypes (2 females, 9 males), 9 mi. S. McCleary, Thurston Co., Washington, VI-25-1966, *Pteridium* sp./ *Macrosiphum pteridis/* Aphidiinae, undetermined (F. G. Andrews, UCR). Holotype and one female paratype on deposit in the United States National Museum, remainder in UCR collection.

Other specimens examined.—(9 females, 6 males) ALBERTA: 2 mi. E. Canmore, VIII-17-1966, *Potentilla fruticosa;* BRITISH COLUMBIA: 2 mi. E. Courtenay, VIII-2-1966, *Cirsium arvense/ Dactynotus ambrosiae;* ONTARIO: Marmora, Ontario, VII-4-1952; Vineland station, V-29-1937.

Hosts.—Known from several host associations:

Macrosiphini
Macrosiphum pteridus (Wilson)
Pteridium sp. Aphidiinae
Dactynotus ambrosiae (Thomas)
Cirsium Arvense (L.) *Aphidius* sp.
Macrosiphum sp.
Potentilla fruticosa L. *Ephedrus* sp.

Geographic range.—Widely distributed across Northern North America. Known from Alberta, British Columbia, Ontario and Washington.

Discussion.—*Alloxysta halli* has a moderate sized radial cell, which groups it with *Quebeci, assimilis, anthracina* and *Commensuratus.* The female is distinguished from these by the lack of an expanded fifth antennal segment and the male by antennal segments 3–5 filimentous and without a bow. Named for Jack Hall who was instrumental in building the initial collection of Western Alloxystinae.

ALLOXYSTA LACHNI (ASHMEAD) NEW COMBINATION
(Figs. 28, 96, 98, 111)

Allotria lachni Ashmead, 1885:302; 1887:13; Cresson, 1887: 180; Dalla Torre, 1893:32.

Allotria (Allotria) lackni; Dalla Torre and Kieffer, 1902:41.

Charips (Charips) lackni; Dalla Torre and Kieffer, 1910:288; Weld, 1920:15.

Charips lachni; Muesebeck et al., 1951:607.

Adult female.—Head, first antennal segment, thorax, abdomen chestnut brown. Antennal segments 2–13, legs, mouthparts honey yellow. Wing veins pale yellow.

Head wider than high, eyes relatively small; entire head with semierect, scattered setae. Antennae 13-segmented, exceeding body as 85:76 (85 = 1.6 mm); segments 1–3 smooth, 4–13 longitudinally ridged; segment 3 narrow, cylindrical, elongated; segments 4–13 expanded to form distinct club; segment 13 short, acuminate; segments 3, 4, 5 in ratio of 55:34:32 (55 = 0.17 mm) (Fig. 96). Pronotum opaquely shining, densely setose on lower lateral margins, remainder sparsely setose. Mesoscutum moderately convex, almost circular when viewed from above; entire surface with scattered setae. Wing broad, exceeding body as 112:76 (112 = 2.0 mm). Radial cell closed, moderate size; length 2.1 times width (Fig. 111); ratio of wing width to radial cell length and width 2.3 and 4.9, respectively; r-1 bowed into cell, r-2 straight. Scutellum broadly constricted, oval behind constriction, covered with erect setae in its

entirety. Mesopleuron flat, triangle moderate size, separated on lower margin by dorsally arcuate margin. Metapleuron, propodeum obscured by dense setal mat. Abdomen with scattered setae on first and second segment. Body length 1.4 mm.

Adult male.—As female, except 14-segmented antennae with segments 1, 2 smooth, 3–14 longitudinally ridged; segments 3, 4, 5 in ratio of 58:44:37 (58 = 0.20 mm) (Fig. 98); antennal segments 3, 4 expanded to give segment clubbed appearance. Ratio of wing width to radial cell length and width 2.3 and 5.9, respectively.

Types.—Holotype, female, Jacksonville, Duval Co., Florida, no date, bred from *"Aphis lachni"*. (USNM).

Other specimens examined.—(14 females, 4 males) BRITISH COLUMBIA: Lindup, I-28-1945, *Abies* sp./ *Cinara* sp., I-29-1945, *Abies* sp./ *Cinara* sp., I-30-1945, *Abies* sp./ *Cinara* sp., I-31-1945, *Abies* sp./ *Cinara* sp., II-1-1945, *Abies* sp./ *Cinara* sp., II-5-1945, *Abies* sp./ *Cinara* sp.; Revelstoke Park, VII-11-1947, *Cinara* sp. CALIFORNIA: Mariposa Co.: Polly Dome, Yosemite National Park, VII-29-1960, *Pinus contorta murrayana;* Nr. Lake Tenaya, Yosemite National Park, X-27-1960 *Pinus contorta murrayana;* Modoc Co.: Knox Mtn. 30 mi. SW Alturas, VII-1-1964; FLORIDA: Alachua Co.: Gainesville, IV-10-1940, *Cinara carolina;* MANITOBA: Ft. Churchill, VIII-15-1952; NORTH CAROLINA: Buncombe Co.: Asheville (Bent Creek), IV-7-1944, pine aphid; Mt. Mitchell, X-8-1967, *Cinara watsoni;* ONTARIO: Maynard, VII-16-1967, *Cinara carolina;* Red Lake Road, Sioux Lookout, VII-22-1957, *Cinara hottesi.*

Hosts.—Known only from coniferous trees and aphids in the tribe Lachnini. The primary parasite hosts are known only from the evidence provided by the mummies *lachni* emerged from. They are all aphidiinae, probably *Pauesia.*

Distribution.—Like other species known to be associated with Lachnini on coniferous trees (*Hemicrisis ruficornis* (Foerster) and *Phaenoglyphis pilosus* n.sp.), this species has a wide distribution. It is known from British Columbia, Manitoba, Ontario, California and Florida.

Discussion.—The inclusion of this species in *Alloxysta* is speculative. Its main differences are the elongate third antennal segment in the female, the complete longitudinal ridging of segments 3–5 in the male, the distinctive shape of the radial cell in both male and female and the Lachnini aphid association. It is retained here as all these differences are quantitative, except the host aphid association and this is generally unknown in the majority of other species.

The type has both antennae broken off and the description states that the segment count is 15 in the males and 14 in the females, however all specimens I have seen are 14-segmented in the males and 13-segmented in the females. They are exactly as the type in all other respects, so I am assuming that there was an error.

ALLOXYSTA LEGUMINOSA (WELD), NEW COMBINATION

(Figs. 28, 95, 103, 109)

Charips leguminosa Weld, 1920:15; Muesebeck et al., 1951:607; Weld, 1952:252.

Adult female.—Head above antennal insertion, thorax, abdomen chestnut brown. Antennal segments 1–5, legs, wing veins honey yellow. Frons, antennal segments 6–13 yellowish-brown.

Head wider than long; frons moderately setiferous, scattered setae on remainder of head. Antennae 13-segmented, subequal to body length as 52:52 (52 = 0.96 mm); segments 1–5 smooth, 6–13 longitudinally ridged; segment 5 gradually expanded apically, with segments 6–13 forming a moderate club; antennal segments 3, 4, 5 in ratio of 15:12:11 (15 = 0.07 mm) (Fig. 95). Pronotun shiny, dense, with setae directly behind head, scattered setae on lateral margins. Mesoscutum moderately convex, roughly circular, slightly wider than long, scattered setae anteriorly. Wing narrow, densely clothed with long setae, exceeding body as 68:46 (68 = 1.2 mm). Radial cell closed, small, elongate, length 2.4 times width (Fig. 109), apical angle acute; r-1; r-2 straight, ratio of wing width to radial cell length and width 2.9 and 7.1, respectively. Scutellum sharply constricted behind mesoscutum, oval behind constriction, glabrous dorsally, moderately setose laterally, posteriorly. Mesopleuron flat, triangle large. Metapleuron distinctly separated from propodeum by raised suture. Body length 1 mm.

Adult male.—As female but 14-segmented antennae with segments 3, 4, 5 in ratio of 16:15:14 (16 = 0.06 mm) (Fig. 103); radial cell length 2.6 times width, ratio of wing width to radial cell length and width 2.9 and 7.5, respectively.

Types.—Holotype, female, Twin Falls, Twin Co., Idaho, VII-19-1919, *Trifolium* sp./ *Nearctaphis bakeri*/ *Aphelinus lapsiligni* (L. H. Weld, USNM), Cat. No. 22589 USNM. Six paratypes (2 males, 4 females), same data distributed as follows: 2 in Acad. Nat. Sci. Phil.; 2 in Ill. Biol. Sur. and 2 in Weld collection.

Hosts.—Known only from the type rearing of *Trifolium* sp./ *Nearctaphis bakeri* (Cowen)/ *Aphelinus lapsiligni* (Howard).

Geographic distribution.—Known only from type locality.

Discussion.—This species is retained at present because the two individuals I have had an opportunity to study are definitive enough based upon a single series of measurements to warrant separation from the *megourae* complex. Additional material and study of the *megourae* complex may show this species to be a part of a quite variable species, *megourae,* or as a part of a large number of extremely similar species. I have retained it here because I feel that the latter is true.

ALLOXYSTA MINUSCULA, NEW SPECIES
(Figs. 23, 76, 77, 78)

Adult female.—Head above antennal insertion, thorax, abdomen yellowish brown. Antennae, legs, wing veins honey yellow. Frons, clypeus dark honey brown.

Head distinctly wider than high; glabrous except for densely setose frons and a few scattered setae on genae. Antennae 13-segmented, equal to body length as 52:52 (52 = 0.96 mm), segments 1–5 smooth, narrow, 6–13 ridged, expanded to form distinct club, segments 3, 4, 5 in ratio of 25:24:21 (25 = 0.09 mm) (Fig. 77). Pronotum moderately setose, except for glabrous area directly behind head. Mesoscutum barely convex, slightly larger than wide, with two lines of setae running longitudinally from base to apex. Wing exceeding body as 78:52 (78 = 1.4 mm). Radial cell open for almost entire length on costal margin, broad, length 2.4 times width (Fig. 78); ratio of wing width to radial cell length and width 2.9 and 6.0, respectively, r-2 slightly angled at midpoint. Scutellum gently constricted, lightly clothed with coarse setae laterally and dorsal one-third posteriorly. Mesopleuron strongly convex, triangle depressed, lightly setose. Metapleuron indistinctly separated from propodeum, metanotum compactly reduced. Body length 0.96 mm.

Adult male.—As female, except antennae 14-segmented, 1–6 smooth, 7–14 ridged, segment 3 straight, cone-shaped, segments 4, 5 gently arcuate, as wide as or wider than any following segments; segments 3, 4, 5, in ratio of 19:22:20 (19 = 0.07 mm); ratio of radial cell length 2.4 times width (as in female (Fig. 77)) 1; ratio of wing width to radial cell length and width 2.2 and 5.3, respectively.

Types.—Holotype, female, and 8 male paratypes, Ottawa, Ontario, 1937 (G. A. Hobbs, CNC). Holotype and 6 paratypes in CNC; 2 paratypes in authors collection.

Host.—Unknown.

Geographic distribution.—Known only from type locality.

Discussion.—This small species is quite distinct in the male, which has its fourth and fifth antennal segments bowed, but only gently so and not distinctly as in *coniferensis, alaskensis* and *vandenboschi.* The female is very similar to *quebeci,* and can be separated only with difficulty (see discussion under *quebeci*).

ALLOXYSTA QUEBECI, NEW SPECIES
(Figs. 27, 87, 88)

Adult female.—Head (except frons), thorax, abdomen dark brown. Frons, antennal segments 1–4, coxae, wing veins brownish-yellow. An-

tennal segments 5–13 brown. Legs, mouthparts honey yellow.

Head much wider than high; frons moderately setose; genae, occiput sparsely setose; vertex to antennal insertions glabrous. Antennae 13-segmented, distinctly clubbed, exceeding body as 67:62 (67 = 1.2 mm); segments 1–5 smooth, 6–13 distinctly ridged, segments 3, 4, 5 narrow, cylindrical with ratio of 26:24:24 (26 = 0.09 mm) (Fig. 88); segments 6–13 distinctly expanded. Pronotum reduced, sparsely setose, shiny. Mesoscutum large, convex, sparsely setose in anterior one-third, and lateral margins, with two longitudinal lines extending to base. Wing wide, length exceeding body as 120:62 (120 = 2.2 mm); radial cell small, length 2.4 times width (Fig. 87), costal margin open on apical one-half; ratio of wing width to radial cell length and width 2.3 and 5.6, respectively, r-2 short, distinctly bowed, reaching costal margin. Scutellum weakly notched at constriction, rounded behind, glabrous dorsally, moderately setose laterally, and posteriorly. Mesopleuron moderately convex, reduced vertically; triangle comprising upper one-third reaching posterior margin. Metapleuron not separated from propodeum, with metanotum obscured by dense setal mat. Body length 1.1 mm.

Adult male.—Unknown.

Types.—Holotype, female, Chimo, Quebec, BIII-17-18-1959 (W. R. M. Mason, CNC). Six female paratypes, same data. Holotype and 4 paratypes in CNC; 2 paratypes in authors collection.

Host.—Unknown.

Geographic distribution.—Known only from type locality.

Discussion.—This small species is known only from the female sex and a single collection. It is very closely related to the species *minuscula,* from which it is separable by the 3, 4, 5 antennal segment ratios (*quebeci* —26:24:24; *minuscula* 2:24:21) and the much narrower wing and more slender club. The r-1 vein of *quebeci* is more than 50% of the length of r-2 (25:40), while in *minuscula* r-1 is short, being less than one-half the length of r-2 (17:45).

ALLOXYSTA RAUCHI, NEW SPECIES
(Figs. 25, 97, 102, 108)

Adult female.—Head above antennal insertion, thorax, abdomen shining chestnut brown. Head beneath antennal insertion yellow-orange. Antennae, wing veins, legs lemon yellow.

Head as wide as tall, glabrous except for moderately setose frons. Antennae 13-segmented, shorter than body as 36:41 (36 = 0.67 mm); segments 1–5 smooth, 6–13 only partially longitudinally ridged, segments 8–13 forming gradually expanding club, segments 3, 4, 5 stout, cylindrical, ratio of 11:8:9 (11 = 0.04 mm) (Fig. 97). Pronotum densely setose throughout. Mesoscutum distinctly convex, circular in outline

when viewed from above, scattered setae anteriorly, laterally and on longitudinal lines trisecting mesoscutum. Wing broad, exceeding body as 50:41 (50 = 0.9 mm). Radial cell closed, veins heavy, cell small, length 2.3 times width (Fig. 108); ratio of wing width to radial cell length and width 2.8 and 6.5, respectively; r-1 short and straight, r-2 very slightly arcuate. Scutellum only slightly constricted, disc oval, glabrous dorsally, densely setose laterally and posteriorly. Mesopleuron moderately convex, triangle small. Metapleuron separated from propodeum by raised ridge, surface of matapleuron and propodeum obscured by dense setal mat. Body length 0.76.

Adult male.—As female, except 14-segmented antennae with third segmented distinctly notched, segments 3, 4, 5 in ratio of 12:12:11 (12 = 0.05 mm) (Fig. 102); ratio of radial cell width to length 2.2 and ratio of wing width to radial cell length and width 2.5 and 6.1, respectively.

Types.—Holotypes, female, 8 mi. SE Spences Bridge, British Columbia, Canada, VII-4-1966, *Populus trichocarpa/ Chaitophorus populicolus/Aphelinus* sp. (F. G. Andrews, UCR). Paratopotypes, 25 females, 13 males. Holotype in USNM; paratypes in authors collection.

Hosts.—Known only from the type data; *Populus trichocarpa* T. & G. *Chaitophorus populicolus* (Thomas)/ *Aphelinus* sp. Specimens reared from sample taken from poplar trees along Nicola River. The surrounding area was a dry sagebrush and thistle dominated canyon environment.

Distribution.—Southwestern Canada.

Discussion.—This distinctive species more closely resembles an undescribed species from the Oriental region than other North American species. It is the only North American species with a club that expands distally, in all others the club is the same width throughout; it also is the only species that has the fourth segment distinctly notched.

It is a pleasure to name this species after one of my colleagues at the University of California, Peter Rauch.

ALLOXYSTA SCHLINGERI, NEW SPECIES
(Figs. 24, 67, 68, 69)

Adult female.—Head above antennal insertion, thorax, abdomen shiny chestnut brown. First 5 antennal segments, frons, mouthparts, legs straw yellow. Antennal segments 6–13 brown.

Head as wide as long; glabrous, except for sparse, hair-like curved setae on gena. Antennae 13-segmented, exceeding body as 50:44 (50 = 0.93 mm), segments 1–5 smooth, sparsely setose, segments 6–13 forming distinct club with segments ridged, densely setose, segments 3, 4, 5 cyclindrical, ratio of 30:25:25 (30 = 0.06 mm) (Fig. 69). Pronotum shiny, densely clothed with hair-like setae behind head, glabrous on lateral margins. Mesoscutum circular, convex, smooth, shining, with few

scattered setae anteriorly. Wing narrow, exceeding body as 65:44 (65 = 1.2 mm). Radial cell open on anterior margin, small, length 2.1 times width (Fig.67); ratios of wing width to radial cell length and width 2.9 and 6.0, respectively, r-2 distinctly angulate just before costal margin, meets costal margin perpendicularly. Scutellum smooth, with scattered, coarse, curvate setae laterally. Mesopleuron roughly triangular; triangle large, extending across dorsal margin of mesopleuron. Metanotum narrow, shallowly grooved. Propodeum, metapleuron reduced, barely exceeding scutellum, densely pubescent. Body length 0.8 mm.

Adult male.—As female, except antennae 14-segmented, 1–4 smooth, 5 lightly ridged, expanded distally to appear as part of club, segment 4 may be slightly bowed, segment 5 appears arcuate in pinned specimens; ratio of segments 3, 4, 5 19:19:16 (19 = 0.07 mm) (Fig. 68); radial cell length 2.3 times width; ratio of wing width to radial cell length and width 2.9 and 6.6, respectively.

Types.—Holotype, male, and 9 paratypes (4 males, 5 females), Shannon Camp, Graham Mts., Graham Co., Arizona, VIII-18-1967, *Carex* sp./ *Iziphya sp./Mesidia* sp. (E. I. Schlinger and F. G. Andrews, UCR). Holotype and one female paratype deposited in the United States National Museum.

Hosts.—This distinctive species was reared from only one sample, of a *Carex* sp. growing along a dirt road in the upper borders of a large meadow area which was infested with an *Iziphya* sp. aphid that was parasitized by a species of *Mesidia* (Aphelinidae).

Geographic distribution.—Known only from the Graham Mountains in Southwestern Arizona at an elevation of approximately 2900 ft.

Discussion.—This species is much different than other *Alloxysta* species with open radial cells. It is small-sized, has narrow wings, small radial cell and is the only known species that is associated with *Mesidia.*

I take pleasure in naming this species after my good friend and associate Evert I. Schlinger, the collector of this species and the collector whose work during the years of 1957 to 1967 supplied the large majority of host-associated specimens used in this study.

ALLOXYSTA VANDENBOSCHI, NEW SPECIES
(Figs. 27, 89, 90)

Adult male.—Head above antennal insertion, thorax, abdomen dark brown. Head beneath antennal insertion, first 5 segments of antennae, wing veins, legs pale yellow.

Head higher than wide; frons moderately clothed with short, stout, semi-erect setae; remainder of head glabrous. Antennae 14-segmented, long, filamentous, exceeding body as 80:71 (80 = 1.6 mm); segments 1–5 smooth, 6–14 ridged, segment 3 straight, cylindrical, segments 4, 5

distinctly bowed, expanded apically, segments 3, 4, 5 ratio 36:40:36 (36 = 0.13 mm) (Fig. 90). Pronotum with sharp, elevated ridges at junction between lateral and anterior surfaces; densely clothed with fine, decumbent setae. Mesoscutum gently convex, with 2 setal lines running longitudinally from apex to base and few scattered setae on lateral margins. Wing wide, exceeding body as 105:71 (105 = 1.9 mm), radial cell medium-sized, length 2.5 times width, (Fig. 89), open along entire costal margin; ratio of wing width to radial cell length and width 1.9 and 4.5, respectively; r-2 short, distinctly bowed, reaching costal margin. Scutellum gently constricted, circular posteriorly; glabrous dorsally, densely setose laterally and posteriorly. Mesopleuron moderately convex, triangle large, reaching posterior border. Metapleuron large, distinctly separated from propodeum by wide suture, partially obscured by dense, erect setae. Body length 1.4 mm.

Adult female.—Unknown.

Types.—Holotype, male, 2 mi. S. Kelsey Bay, Vancouver, British Columbia, VII-1-1966, *Alnus* sp./ *Euceraphis gillette/ Praon* sp. (F. G. Andrews, UCR). Paratypes, 1 male, Mile 140, Steese Bay, Alaska, VI-21-1951 (Mason and McGillis, CNC). Holotype in USNM; paratype in CNC.

Host.—Known only from the single rearing from *Alnus* sp./*Euceraphis gillete* (Davidson)/ *Praon* sp. in wooded area several hundred yards from ocean front.

Geographic range.—North end of Vancouver Island and Southwestern Alaska.

Discussion.—This species is known only from the male and only from two specimens. It is readily distinguished from all *Alloxysta,* except *alaskensis* and *coniferensis* by the cylindrical third antennal segment and distinctly bowed fourth and fifth antennal segments. In *minuscula* the bow is gentle and in *anthracina,* the segments appear more clubbed than bowed. The species *vandenboschi* can be separated from *alaskensis* by the less distinct bow of segments 4 and 5, and the less elongate radial cell and equal length of antennal segments 3 and 5. Distributionally, it is well within the probable range of *alaskensis,* but is widely separated from *coniferensis,* which is known only from Tennessee.

I take pleasure in naming this species after Robert van den Bosch, an associate on this aphid-parasite study and an avid aphid collector.

ALLOXYSTA VICTRIX (WESTWOOD)

(Figs. 15, 24, 92, 99, 105)

Allotria victrix Westwood, 1833:495; Giraud, 1860:127; Taschenberg, 1866:129; Forester, 1869:340; Buckton, 1874:153; Cameron (1887) 1886:85; 1889:54; 1890:242; Dalla Torre, 1893:36; Kieffer, 1900:115;

Lameere, 1907:195.

Xystus victrix; Rondani, 1878:177; Ashmead, 1903:142.

Allotria (Allotria) victrix: Dalla Torre and Kieffer, 1902:41; Kieffer, 1903:75.

Charips (Charips) victrix; Dalla Torre and Kieffer, 1910:285; Haviland, 1921:452; Hedicke, 1928:94.

Charips victrix; Rohwer and Fagan, 1917:360, Muesebeck, Krombein, Townes, et al., 1951:607.

Alloxysta victrix; Hellen, 1963:116.

Charips victrix infuscatus Dunn, 1949:106. New Synonymy?

Cynips ruficeps Zetterstedt, 1838:410.

Xystus erythrocephalus Hartig, 1840:199.

Allotria erythrocephaulus; Dahlbom, 1842:table 2:3; Thomson, 1962:-406; Schelechtendal, 1875:160.

Adult female.—Head, first four antennal segments, wing veins, legs pale lemon yellow. Thorax, abdomen, dark reddish-brown. Antennal segments 4–13 brown.

Head as wide as long, frons covered with short semi-erect setae, remainder of head glabrous. Antennae 13-segmented, filamentous, segments 1–4 smooth, 5 with several longitudinal ridges, 6–13 completely longitudinally ridged, antennal segments 3, 4, 5 in ratio of 44:40:40 (44 = 0.15 mm) (Fig. 92), long, narrow, length of segment 3 at least 6 times width. Pronotum densely pubescent on lower lateral portions, glabrous on narrow band running from tegulae to behind head. Mesoscutum distinctly convex, circular when viewed from above, scattered setae laterally. Wing large, exceeding body as 94:84 (94 = 1.7 mm). Radial cell closed, large, length 2.8 times width; ratio of wing width to radial cell length and width 1.9 and 5.2, respectively, r-1 straight, r2 very slightly arcurate (Fig. 105). Scutellum sharply notched, not expanded posteriorly so disc small, oval, glabrous dorsally, densely setose laterally, posteriorly. Mesopleuron flat, triangle moderate, not reaching posterior margin. Metapleuron indistinctly separated from propodeum. Body length 1.7 mm.

Adult male.—As female except 14-segmented antennae with segments 3–5 bowed, 3 gently; 4, 5 distinctly. Individually expanded distally, not basally (Fig. 99); radial cell length 2.7 width; ratio of wing width to radial cell length and width 2.0 and 5.5, respectively.

Types.—Holotype, female, England, June, 1833, reared from rose aphid, in the Hope University Museum, Oxford, England. There are no paratypes known, although in the original Westwood collection there are 15 specimens of *Alloxysta victrix,* but each is mounted differently and

none are labeled.

Other specimens examined.—(115 females, 40 males), BRITISH COLUMBIA: Nimpo Lake, VII-19-1960, *Rosa* sp./*Macrosiphum* sp./*Praon* sp.; Ocean Falls, VII-13-1960, *Picea* sp./*Neomyzaphis abietina/Aphidius* sp.; 12 mi. E. Port Alberni, Vancouver Is., VI-30-1966, *Woodwardia* sp./*Macrosiphum pteridis.* CALIFORNIA: Alameda Co.: Albany, X-4-1965, *Medicago sativa/ Acyrthosiphon pisum/ Aphidius smithi;* X-18-1965, *Medicago sativa/ Acyrthosiphon pisum/ Aphidius smithi,* XI-5-1965, *Medicago sativa/ Acyrthosiphon pisum/ Aphidius smithi;* Berkeley, "Lab. Colony", 1966, *Medicago sativa/ Therioaphis maculata/ Trioxys utilis;* Fremont, IV-12-1966 to VI-8-1966, *Medicago sativa/ Acyrthosiphon pisum/ Aphidius smithi;* Los Angeles Co.: Agoura, IV-14-1960, *Medicago sativa/ Acyrthosiphon pisum/ Aphidius smithi;* Monterey Co.: Gone Mt., VIII-9-1962, *Arbutus menziesii/ Wahlgreniella arbuti;* Riverside Co.: Riverside, III-3-1958, *Vinca minor/ Myzus persicae/ Aphidius nigritelus,* III-21-1958 *Rosa* sp./ *Macrosiphum rosae/ Aphidius alius,* III-24-1958, *Rosa* sp./ *Macrosiphum rosae/ Aphidius alius,* IV-25-1959, *Rosa* sp./ *Macrosiphum rosae/ Aphidius alius,* V-14-1959, *Lycopersicum esculentum/ Macrosiphum euphorbiae/ Aphelinus howardi,* I-10-1960, *Rosa* sp./ *Macrosiphum euphorbiae/ Aphidius alius,* III-30-1960, *Rosa* sp./ *Macrosiphum solanifolii/ Aphidius alius,* IV-1-1960, *Artemesia douglasiana/ Macrosiphoniella ludovicianae/ Aphidius confusus,* IV-4-1960, *Artemesia douglasiana/ Macrosiphoniella ludovicianae/ Aphidius confusus,* VI-10-1960, *Rosa* sp./ *Macrosiphum solanifolii/ Aphidius alius,* IV-16-1960, *Rosa* sp./ *Macrosiphum euphorbiae/ Aphidius alius,* XI-10-1960, *Melilotus alba/ Acrythosiphon pisum/* Aphidiinae, VI-21-1961, *Artemesia douglasiana/ Macrosiphoniella ludovicianae/ Aphidius* sp., V-22-1962, *Rosa* sp./ *Macrosiphum euphorbiae/* Aphidiinae, II-15-1963, *Rosa* sp./ *Masonaphis morrisoni.* San Bernardino Co.: Ontario, IV-14-1957, *Rosa* sp./ *Macrosiphum rosae/ Aphidius avenaphis.* Santa Clara Co.: Milpitas, XII-15-1965, *Medicago sativa/ Acyrthosiphon pisum/ Aphidius smithi,* III-10-1966, *Medicago sativa/ Acyrthosiphon pisum/ Aphidius smithi.* Stanislaus Co.: Keyes, XIII-24-1965 to IX-7-1966, *Medicago sativa/ Acyrthosiphon pisum/ Aphidius smithi.* MAINE: Aroostook Co., VIII-29-1963, ex *Macrosiphum euphorbiae.* MARYLAND: Montgomery Co.: Bethesda, VI-2-1967, VII-19-1967. NOVA SCOTIA: VII-31-1951. VIRGINIA: Fairfax Co.: Arlington. WASHINGTON: Chilan Co.: 10 mi. NW Leavenworth, VII-1-1960, *Lupinus* sp./ *Macrosiphum albifrons/Aphidius* sp., Whitman Co.: Pullman, VII-24-1908 and VII-25-1908. WASHINGTON, D.C.: VIII-22-1894 to VIII-28-1894, ex *Siphon liriodendri; Liriodendron* sp. WISCONSIN: no further data; Waupaca Co., Waupaca, VIII-7-1920, *Macrosiphum euphorbiae;* VIII-21-1920, *Macrosiphum euphorbiae.*

Hosts.—This species is most commonly associated with Dactynotinae

aphids parasitized by *Aphidius* sp. (Table 7). It is closely related morphologically to *Alloxysta brassicae* and like *brassicae* has a wide distribution. The host preferences are quite different as *brassicae* is almost always associated with the Cruciferae/Myzinae/ *Diaeretiella rapae* complex and is recorded from *Rosa* sp./ *Aphidius* sp. (which is the most common host of *victrix)* on only one occasion.

TABLE 7. Known host associations of *Alloxysta victrix* (Westwood).

Aphid subfamily—Aphid host—Plant host	*Primary parasite*
APHIDIINAE	
Myzus persicae (Sulzer)	
Vinca minor L.	*Aphidius nigriteleus* Smith
Neomyzaphis abietina (Walker)	
Picea sp.	*Aphidius* sp.
DACTYNOTINAE	
Macrosiphoniella ludovicianae (Oestlund)	
Artemesia douglasiana Bess. in Hook	*Aphidius confusus* Ashmead
Macrosiphum sp.	
Rosa sp.	*Praon* sp.
Macrosiphum rosae (L.)	
Rosa sp.	*Aphidius alius* Muesebeck
Rosa sp.	*Aphidius avenaphis* (Fitch)
Macrosiphum euphorbiae (Thomas)	
Rosa sp.	*Aphidius alius* Muesebeck
Lycopersicon esculentum Mill.	*Aphelinus howardi* Dalla Torre
Macrosiphum pteridis Wilson	
Woodwardia sp.	?
Macrosiphum albifrons Essig	
Lupinus sp.	*Aphidius pulcher* Baker
Acyrthosiphon pisum (Harris)	
Melilotus alba Desr.	Aphidiinae
Medicago sativa L.	*Aphidius smithi* Sharma & Subba Rao
Masonaphis morrisoni (Swaine)	
Rosa sp.	?
Wahlgreniella arbuti (Ferrari)	
Arbutus menziesii Pursh.	?
THERIOAPHIDINAE	
Medicago sativa L.	*Therioaphis maculata* (Oestlund) *Trioxys complanatus** Quilis

Geographic distribution.—This is a wide-spread species known from throughout North America and Europe.

Discussion.—The distinctly bowed flagellar segments 3–5 of this species differentiate it from all species except *brassicae.* It can be separated from *brassicae* by the yellow head, basally conical flagellar segments of

* A. P. Gutierrez. 1970. Ann.Ent.Soc.Amer. 63:1705–1709.

the male antennae and narrower, more elongate flagellar segments of the female antennae.

ALLOXYSTA XANTHOPSIS (ASHMEAD), NEW COMBINATION

(Figs. 9, 14, 23, 93, 104, 107)

Allotria xanthopsis Ashmead, 1896:185.

Allotria (Allotria) xanthopsis; Dalla Torre and Kieffer, 1902:41.

Charips (Charips) xanthopsis; Dalla Torre and Kieffer, 1910:290; Weld, 1920:15.

Charips xanthopsis; Muesebeck et al., 1951:607; Weld, 1957:20.

Charips hayhursti Kieffer, 1909:481; Muesebeck et al., 1951:607; Weld, 1952:252.

Charips (Charips) hayhursti; Weld, 1920:15.

Adult female.—Head except frons, thorax, abdomen dark chestnut brown. Antennal segments 1–5, frons, legs honey yellow. Antennal segments 6–13, wing veins brown.

Head wider than tall, frons sparsely setose with short semi-erect setae, gena, occiput with scattered long curvate setae, vertex glabrous. Antennae 13-segmented, filamentous, club weakly formed; segments 1–5 smooth, 6–13 longitudinally ridged; segments 3, 4, 5 ratio 18:16:19 (18 = .07 mm) (Fig. 93); segments 3, 4 cylindrical, compact, segment 5 expanded in apical three-fourths. Pronotum shiny, sparsely pubescent only on anterior margin. Mesoscutum oval, wider than long, moderately convex, with scattered setae on lateral margins and two lines trisecting mesoscutum. Wing moderate, exceeding body as 72:58 (72 = 1.3 mm). Radia cell closed, moderate sized and broad, length 2.3 times width (Fig. 107); ratio of wing width to radial cell length and width 2.6 and 6.2, respectively; r-1 long, r-2 only $1.3 \pm .1$ times as long as r-1. Scutellum smooth, only slightly constricted behind mesoscutum and little expanded behind constriction, glabrous dorsally, long decumbent setae laterally, posteriorly. Mesopleuron moderately convex, triangle narrow with lower margin sinuate. Metapleuron indistinctly separated from propodeum. Body length 1.1 mm.

Adult male.—As female except 14-segmented antennae with segments 4, 5 gently, distinctly bowed, antennal segments 3, 4, 5 ratio of 23:24:22 (23 = 0.81 mm) (Fig. 104); ratio of wing width to radial cell length and width 2.6 and 6.0, respectively.

Types.—Holotype, female, Crescent City, Putnam Co., Florida, no data on specimen (H. G. Hubbard, USNM). Type in United States National Museum.

Other specimens examined.—(82 females, 66 males) ALASKA: Fair-

banks, Birch Hill, VII-4-1948. BRITISH COLUMBIA: 10 mi. W. Williams Lake, VII-5-1960, *Ulmus* sp./*Capitophorus* sp./Aphidiinae. CALIFORNIA: Alameda Co.: Albany, X-16-1965, *Medicago sativa/Therioaphis maculata/Trioxys utilis.* Los Angeles Co.: Glendale, VI-17-1960, *Rosa* sp./*Macrosiphum rosae/Aphidius alius;* Los Angeles, Orange aphis; Whittier, XII-17-1910, I-5-1911, I-10-1912, *Rosa* sp./*Macrosiphum rosae,* II-1912, III-14-1912. Orange Co.: Santa Ana, X-5-1908, *Aphis gossypii.* Riverside Co.: Riverside, IV-14-1957, *Abelia gaucheri*/Aphidiinae, XI-19-1957, *Melilotus alba/Aphis medicaginus/Lysiphlebus testaceipes,* II-27-1958, *Viburnum suspensum/Myzus persicae/Lysiphlebus testaceipes,* III-24-1960, *Nasturtium* sp./*Myzus persicae/Aphidius matricariae,* IV-10-1960, *Cotyledon* sp./*Aphis gossypii/Lysiphlebus testaceipes,* VI-16-1960, *Rosa* sp./*Macrosiphum euphorbiae/Aphidius alius,* XI-10-1960, *Rumex crispus/Aphis rumicis/Lysiphlebus testaceipes,* III-6-1961, *Rumex crispus/Aphis* sp., I-20-1963, II-27-1966, *Encelia farinosa/Dactynotus katonkae,* II-11-1967, *Encelia farinosa/Dactynotus katonkae.* San Bernardino Co.: Thurmon Flat, Mill Creek, VII-11-1964, *Arctostaphylos* sp./*Masonaphis* sp. San Diego Co.: Rancho Santa Fe, V-2-1960, *Juglans regia/Chromaphis juglandicola/Trioxys pallidus.* Tulare Co.: 3 mi. E. Farmerville, V-13-1967, ex *Juglans* sp. UTAH: Salt Lake Co.: Murray, VIII-23-1913, IX-6-1913; Salt Lake, VII-25-1913.

Hosts.—*Alloxysta xanthopsis* has been associated with numerous hosts in Southern California. The association pattern is quite different from that shown by the other Alloxystinae species which have numerous host records. In *Phaenoglyphis ambrosiae, P. americana, Alloxysta victrix* and *A. brassicae,* the aphid hosts are limited to two subfamilies while the primary parasite hosts are spread through all three of the subfamilies present, but in *xanthopsis* all of the known hosts are in the Aphidiinae while the aphid hosts are from four subfamilies (Table 8). The majority of host rearings are from several Aphidiinae species and almost exclusively from *Lysiphlebus testaceipes* (Cresson).

Geographic distribution.—This species is restricted in its distribution to western North America, where it is found from Alaska down through British Columbia and from utah to California.

Discussion.—This species is very distinctive and easy to separate from other *Alloxysta* with closed radial cells by the shape of the radial cell and the distinctive bow of the fourth and fifth antennal segments of the male.

The morphological characters are extremely uniform and show little variability of measurement. The one specimen taken in Alaska is the exception as the radial cell is slightly more elongate than typical.

TABLE 8. Known host associations of *Alloxysta xanthopsis* (Ashmead).

Aphid subfamily—Aphid host—Plant host	*Primary parasite*
CALAPHIDINAE	
Chromaphis juglandicola (Kaltenbach)	
Juglans regia L.	*Trioxys pallidus* Haliday
THERIOAPHIDINAE	
Therioaphis maculata (Oestlund)	
Medicago sativa L.	*Trioxys utilis* Muesebeck
APHIDINAE	
Aphis gossypii Glover	
Cotyledon sp.	*Lysiphlebus testaceipes* (Cresson)
Mesembryanthemem sp.	*Lysiphlebus testaceipes* (Cresson)
Aphis helichrysi Kaltenbach	
Artemisia doglasiana Bess. in Hook	*Lysiphlebus testaceipes* (Cresson)
Aphis medicaginus Koch	
Melilotus alba Desr.	*Lysiphlebus testaceipes* (Cresson)
Aphis rumicis L.	
Rumex crispus L.	*Lysiphlebus testaceipes* (Cresson)
Capitophorus sp.	
Ulmus sp.	Aphidiinae
Myzus persicae (Sulzer)	
Viburnum suspensa Lindl.	*Lysiphlebus testaceipes* (Cresson)
Nasturtium sp.	*Aphidius matricariae* Haliday
DACTYNOTINAE	
Dactynotus katonkae (Hottes)	
Encelia farinosa Gray	Aphidiinae
Macrosiphum rosae (L.)	
Rosa sp.	*Aphidius alius* Muesebeck
Masonaphis sp.	
Arctostaphylos sp.	?

APPENDIX A

Catalog of the Alloxystinae

The following is a bibliographical synonymy of the subfamily Alloxystinae, with miscellaneous notes on the taxonomy, geographic distribution, status and location of type specimens. The list is primarily a literature review and only in cases where changes led to nomenclatorial stability have changes at the specific level been made. The European Alloxystinae is confused, the result of the loss of almost all of Kieffer's types and the failure of early workers to see other workers' types. Intensive study of the extant types and literature will be necessary before the status of the European species can be determined. Species have been assigned to genera in accordance with my concept, which is the same as that of the most recent European worker, W. Hellen.

An exhaustive search of the literature has been made and all references have been included in the synonymy. A single asterisk indicates that the species is North American and the synonymy can be found in the above text. A double asterisk indicates that the author has seen the type.

ALLOXYSTA Foerster, 1869

Aloxysta afer (Kieffer), 1903, **new combination**
Allotria afer Kieffer, 1904:63.
Charips (Charips) afer; Dalla Torre & Kieffer, 1910:287.
Type: unknown.
Distribution: unknown.
Hosts: unknown

Alloxysta affinis (Baker), 1896 (*)(**)

Alloxysta alaskensis Ashmead, 1902 (*)(**)

Alloxysta albipes (Kieffer), 1903, **new combination**
Allotria (Allotria) albipes Kieffer, 1904:600; Dessart, 1969:195.
Charips (Charips) albipes; Dalla Torre & Kieffer, 1910:286.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: unknown.

Alloxysta albosignata Kieffer, 1902
Alloxysta albosignata Kieffer, 1902:10.
Alloxysta (Alloxysta) albosignata; Dalla Torre & Kieffer, 1902: 38; Kieffer, 1904:38; Dalla Torre & Kieffer, 1910:263.
Type: female, Budapest, Hungary; repository unknown.
Distribution: Hungary.
Hosts: unknown.

Alloxysta ancylocera (Cameron), 1887, **new combination** (**)
Allotria ancylocera Cameron, 1887:85; Cameron, 1889:55; Cameron, 1890:246; Dalla Torre, 1893:30.
Allotria (Allotria) ancylocera; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:51.
Charips (Charips) ancylocerus; Dalla Torre & Kieffer, 1910:275.
Charips ancylocera; Hafez, 1961:85.
Type: male, Carruber Glen, Scotland, August; repository unknown.
Distribution: England, Netherlands and Scotland.
Hosts: *Brevicoryne brassicae/Aphidius (Diaeretiella) rapae.*

Alloxysta anthracina Andrews (*)(**)

Alloxysta aperta (Hartig), 1841

Xystus apertus Hartig, 1841:353.
Allotria aperta; Thomson, 1862:410; Cameron, (1887) 1886:88; Dalla Torre, 1893:30.
Allotria apertus; Taschenberg, 1866:129.
Dilyta aperta; Kieffer, 1900:114.
Alloxysta (Alloxysta) aperta; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:41.
Alloxysta aperta; Dalla Torre & Kieffer, 1910:260; Hellen, 1931:4.
Type: male; Zoologische Sammlung des Bayerischen States, Munich, Germany.
Distribution: Germany, Scotland and England.
Hosts: unknown.

Alloxysta aphidicida (Rondani), 1848, **new combination**
Synergus aphidicida Rondani, 1848:8; Kieffer, 1904:77.
Allotria aphidicida; Dalla torre, 1893:30.
Allotria (Allotria) aphidicida; Dalla Torre & Kieffer, 1902:41.
Charips (Charips) aphidicida; Dalla Torre & Kieffer, 1910:288.
Type: unknown.
Distribution: Italy.
Hosts: unknown.

Alloxysta aphidae (Froggatt), 1904, **new combination**
Hypodiranchis aphidae Froggatt, 1904:-603.
Allotria aphidae; Girault, 1931:2.
Charips aphidae; Weld, 1951:252.
Type: unknown.
Distribution: Wales.
Hosts: peach aphis.

Alloxysta apteroidea Hellen, 1963
Alloxysta apteroidea Hellen, 1963:23.
Type: female, Runsala, Finland; Zoological Museum, Helsinfors, Finland.
Distribution: Finland.
Hosts: unknown.

Alloxysta arcuata (Kieffer), 1902, **new combination**
Allotria (Allotria) arcuata; Kieffer, 1902:12; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:54.
Charips (Charips) arcuatus; Dalla Torre & Kieffer, 1910:277.
Allotria minuta; Cameron, (1887) 1886:86; Cameron, 1889:55; Cameron, 1890:234.
Type: type series; British Museum.
Distribution: England, Scotland and Spain.
Hosts: *Eryngium campestre* and *Rumex acetosella*/aphis.

Alloxysta areolata (Kieffer), 1909, **new combination (*)**

Alloxysta australiae (Ashmead), 1900, **new combination**
Allotria australiae Ashmead, 1900:330.
Allotria (Allotria) australiae; Dalla Torre & Kieffer, 1902:41.
Charips (Charips) australiae; Dalla Torre & Kieffer, 1910:290.
Type: female, No. 4876; USNM.
Distribution: Australia.
Hosts: unknown.

Alloxysta bakeri (Kieffer), 1907, **new combination (*)**

Alloxysta basimacula (Cameron), 1887
Allotria basimacula Cameron, 1887:87; Cameron, 1889:55; Cameron, 1890:252; Dalla Torre, 1893:30.
Dilyta basimacula; Kieffer, 1900:114.
Alloxysta (Alloxysta) basimacula; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:36; Dalla Torre & Kieffer, 1910:258.
Type: British Museum.
Distribution: Scotland.
Hosts: unknown.

Alloxysta bicolor Baker, 1896 (*)(**)

Alloxysta brachycera Hellen, 1963
Alloxysta brachycera Hellen, 1963:14.
Type: female, Nystad, Finland; Helsingfors University Museum, Helsinki, Finland.
Distribution: Finland.
Hosts: unknown.

Alloxysta brachyptera brachyptera (Hartig), 1840
Xystus brachypterus Hartig, 1840:200; Hartig, 1841:351.
Allotria brachyptera; Giraud, 1860:131; Thomson, 1862:410; Taschenberg, 1866:129; Cameron, (1887) 1886:88; Cameron, 1890:234; Dalla Torre, 1893:30.
Pezophycta brachyptera; Foerster,

1869:339; Kieffer, 1900:114; Dalla Torre & Kieffer, 1902:42; Ashmead, 1903:141; Kieffer, 1904:19; Lameere, 1907:195; Rohwer & Fagan, 1917:373; Hedicke, 1928:95; Weld, 1952:250.

Pezophycta brachyptera brachyptera; Dalla Torre & Kieffer, 1910:292.

Alloxysta brachyptera; Hellen, 1931:5.

Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.

Distribution: Austria, England, France, Germany, Scotland and Sweden.

Hosts: *Fraxinus/Pemphigus bumeliae.*

Alloxysta brachyptera castanea (Kieffer), 1903, **new combination**

Pezophycta brachyptera castanea; Kieffer, 1904:593; Dalla Torre & Kieffer, 1910:292; Dessart, 1969:188.

Type: Natural History Museum, Amiens, France.

Distribution: France.

Hosts: unknown.

Alloxysta brassicae (Ashmead), 1887, **new combination (*)(**)**

Alloxysta brevicornis (Kieffer), 1902, **new combination**

Allotria (Allotria) brevicornis; Kieffer, 1902:15; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:71.

Charips (Charips) brevicornis; Dalla Torre & Kieffer, 1910:284.

Type: unknown.

Distribution: France.

Hosts: *Bupleurum falcatum/Aphis* sp. ?

Alloxysta brevis (Thomson), 1862, **new combination**

Allotria brevis Thomson, 1862:408; Cameron, 1884:267; Cameron, 1886:86; Dalla Torre, 1893:30.

Allotria (Allotria) brevis; Dalla Torre & Kieffer, 1902:40; Kieffer 1904:51.

Charips (Charips) brevis; Dalla Torre & Kieffer, 1910:276.

Type: Lund University Museum, Lund, Sweden.

Distribution: Scotland & Sweden.

Hosts: unknown.

Alloxysta brevitarsis (Thomson), 1862

Allotria brevitarsis Thomson, 1862:409; Dalla Torre, 1893:30.

Dilyta brevitarsis; Kieffer, 1900:114.

Alloxysta (Alloxysta) brevitarsis; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:33; Dalla Torre & Kieffer, 1910:257.

Alloxysta brevitarsis; Hellen, 1963:14–15

Type: Lund University Museum, Lund, Sweden.

Distribution: France, Lappland & Sweden.

Hosts: *Epilobium spicatum/Aphis* sp.

Alloxysta cabrerai (Kieffer), 1904, **new combination**

Allotria (Allotria) cabrerai Kieffer, 1904:63.

Charips (Charips) cabrerai; Kieffer, 1910:286.

Type: unknown.

Distribution: Tenerife Island.

Hosts: unknown.

Alloxysta caledonica (Cameron), 1887 (**)

Allotria calendonica Cameron, 1887:89; Cameron, 1889:56; Cameron, 1890:257; Dalla Torre, 1893:30.

Dilyta calendonica; Kieffer, 1900:114.

Alloxysta (Alloxysta) caledonica; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:31; Dalla Torre & Kieffer, 1910:256.

Type: Mugdock, near Glasgow, Scotland; British Museum.

Distribution: Scotland.

Hosts: unknown.

Alloxysta cameroni (Dalla Torre & Kieffer, 1910) **new combination (**)**

Charips (Charips) cameroni Dalla Torre & Kieffer, 1910:283.

Allotria ruficeps Cameron, 1883:365; Cameron, (1887) 1886:85; Cameron, 1889:54; Cameron, 1890:241; Dalla Torre, 1893:35.

Allotria (Allotria) ruficeps; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:70.

Type: female, New Galloway, Scotland, June; British Museum.

Distribution: England & Scotland.

Hosts: unknown.

Alloxysta campyla Kieffer, 1903

Alloxysta campyla Kieffer, 1904:597; Dessart, 1969:190.

Alloxysta (Alloxysta) campyla; Dalla Torre & Kieffer, 1910:263.

Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: unknown.

Alloxysta castanea (Hartig), 1841
Xystus castaneus Hartig, 1841:352; Taschenberg, 1866:130.
Allotria castanea; Cameron, 1890:233; Dalla Torre, 1893:30.
Dilyta castanea; Kieffer, 1900:114.
Alloxysta (Allexysta) castanea; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:32; Dalla Torre & Kieffer, 1910:256.
Alloxysta castanea; Hellen, 1963:14.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England, France & Germany.
Hosts: *Papaver somniferum/ Aphis* sp.

Alloxysta castaneiceps (Kieffer), 1904, **new combination**
Allotria (Allotria) castaneiceps Kieffer, 1904:602; Dessart, 1969:195.
Charips (Charips) castaneiceps; Dalla Torre & Kieffer, 1910:287.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: unknown.

Alloxysta cincta (Hartig), 1841, **new combination**
Xystus cinctus Hartig, 1841:351; Taschenberg, 1866:129; Dalla Torre, 1893:30.
Allotria (Allotria) cincta; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:50.
Charips (Charips) cinctus; Dalla Torre & Kieffer, 1910:275.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany.
Hosts: unknown.

Alloxysta circumscripta (Hartig), 1841
Xystus circumscriptus Hartig, 1841:352; Rondani, 1878:172.
Allotria circumscripta; Giraud, 1860:127; Taschenberg, 1866:129; Cameron, (1887) 1886:86; Cameron, 1889:55; Cameron, 1890:233; Dalla Torre, 1893:31; Kieffer, 1900:115.
Allotria (Allotria) circumscripta; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:56.
Charips (Charips) circumscriptus; Dalla Torre & Kieffer, 1910:277.
Alloxysta circumscripta; Hellen, 1963:17.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England, Germany & Scotland.
Hosts: Fennel/aphis; *Raphanus/Aphis* sp.; *Chaerophyllum sylvestre/ Aphis pini; Aphis ribis; Aphis sambuci.*

Alloxysta citripes britannica Kieffer, 1902
Alloxysta citripes brittanica Kieffer, 1902:11.
Alloxysta (Alloxysta) citripes britannica; Dalla Torre & Kieffer, 1910:-262.
Type: unknown.
Distribution: England.
Hosts: unknown.

Alloxysta citripes citripes (Thomson), 1862
Allotria citripes Thomson, 1862:410; Cameron, 1884:267; Cameron, (1887) 1886:87; Cameron, 1889:55; Cameron, 1890:255; Dalla Torre, 1893:31.
Dilyta citripes; Kieffer, 1900:114.
Alloxysta (Alloxysta) citripes; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:42.
Alloxysta (Alloxysta) citripes citripes; Dalla Torre & Kieffer, 1910:2261.
Type: Lund University Museum, Lund, Sweden.
Distribution: England, Scotland & Sweden.
Hosts: unknown.

Alloxysta commensuratus Andrews (*) (**)

Alloxysta coniferensis Andrews (*) (**)

Alloxysta crassa (Cameron), 1889
Allotria crassa Cameron, 1889:56; Cameron, 1890:254; Dalla Torre, 1893:-31.
Dilyta crassa; Kieffer, 1900:114.
Alloxysta (Alloxysta) crassa; Dalla Torre & Kieffer, 1902:38; Kieffer,

1904:40; Dalla Torre & Kieffer, 1910:261.
Alloxysta crassa; Hellen, 1963:12.
Type: British Museum.
Distribution: England & Scotland.
Hosts: unknown.

Alloxysta crassicornis (Thomson) 1862
Allotria crassicornis Thomson, 1862:407; Dalla Torre, 1893:31.
Allotria (Allotria) crassicornis; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:65.
Charips (Charips) crassicornis; Dalla Torre & Kieffer, 1910:281.
Alloxysta crassicornis; Hellen, 1963:19.
Type: Lund University Museum, Lund, Sweden.
Distribution: Sweden.
Hosts: unknown.

Alloxysta cursor (Hartig), 1840, **new combination**
Xystus cursor Hartig, 1840:200; Hartig, 1841:351.
Allotria cursor; Giraud, 1860:131; Taschenberg, 1866:129.
Pezophycta cursor; Kieffer, 1900:114; Dalla Torre & Kieffer, 1902:42; Kieffer, 1904:18; Dalla Torre & Kieffer, 1910:292; Hedicke, 1928:95.
Allotria pedestris; Cameron, (1887) 1886:88; Cameron, 1890:249; Dalla Torre, 1893:34.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England, Germany & Scotland.
Hosts: unknown.

Alloxysta curvicornia (Cameron), 1883
Allotria curvicornis Cameron, 1883:366; Cameron, (1887) 1886:85; Cameron, 1890:245; Dalla Torre, 1893:31.
Allotria (Allotria) curvicornis; Dalla Torre & Kieffer, 1902:40.
Allotria (Allotria) curvicornis; Kieffer, 1904:52.
Charips (Charips) curvicornis; Dalla Torre & Kieffer, 1910:276.
Charips curvicornis; Dunn, 1949:106.
Alloxysta curvicornis; Hellen, 1963:17.
Type: British Museum.
Distribution: England & Scotland.
Hosts: Potatoes/*Myzus persicae.*

Alloxysta d'arci (Girault), 1933, **new combination**
Allotria d'arci Girault, 1933:2.
Charips d'arci; Weld, 1952:252.
Type: unknown.
Distribution: Australia.
Hosts: unknown.

Alloxysta defecta (Hartig), 1841
Xystus defectus Hartig, 1841:352.
Allotria defecta; Giraud, 1860:130; Taschenberg, 1866:129.
Allotria defectus; Cameron, (1887) 1886:87; Dalla Torre, 1893:31.
Dilyta defecta; Kieffer, 1900:114.
Alloxysta (Alloxysta) defecta; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:38; Dalla Torre & Kieffer, 1910:259.
Alloxysta defecta; Hellen, 1963:15.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England & Germany.
Hosts: unknown.

Alloxysta dicksoni Andrews (*) (**)

Alloxysta discreta (Foerster), 1869, **new combination**
Nephycta discreta Foerster, 1869:340; Dalla Torre, 1893:36; Kieffer, 1900:114; Dalla Torre & Kieffer, 1902:41; Ashmead, 1903:142; Kieffer, 1904:22; Dalla Torre & Kieffer, 1910:291; Rohwer & Fagan, 1917:371; Weld, 1952:250.
Type: Humboldt University Museum, Berlin, Germany.
Distribution: Germany.
Hosts: unknown.

Alloxysta dolichocera (Cameron), 1889, **new combination**
Allotria dolichocera Cameron, 1889:55; Cameron, 1890:246; Dalla Torre, 1893:31.
Allotria (Allotria) dolichocera; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:52.
Charips (Charips) dolichocerus; Dalla Torre & Kieffer, 1910:276.
Type: British Museum.
Distribution: England & Scotland.
Hosts: unknown.

Alloxysta erythrothorax dubia Kieffer, 1902

Alloxysta erythrothorax dubia Kieffer, 1902:10; Dessart, 1969:190.
Alloxysta (Alloxysta) erythrothorax dubia; Kieffer, 1904:34; Dalla Torre & Kieffer, 1910:258.
Type: Natural History Museum, Amiens, France.
Distribution: Austria, Denmark, Germany, France, Holland & Norway.
Hosts: *Prunus domestica/Aphis; Phragmites communis/*Aphide.

Alloxysta erythrothorax erythrothorax (Hartig), 1840
Xystus erythrothorax Hartig, 1840:200; Hartig, 1841:351; Rondani, 1878:174.
Allotria erythrothorax; Giraud, 1860:130; Taschenberg, 1866:129; Dalla Torre, 1893:31.
Dilyta erythrothorax; Kieffer, 1900:114.
Alloxysta (Alloxysta) erythrothorax; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:34.
Alloxysta (Alloxysta) erythrothorax erythrothorax; Dalla Torre & Kieffer, 1910:257.
Alloxysta erythrothorax; Haviland, 1921:452; Hellen, 1963:11.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany
Distribution: Austria, England, France, Germany, Lappland & Sweden.
Hosts: *Prunus* spp. & *Aspidiatus rosae/ Hyalopterus pruni.*

Alloxysta femoralis (Hartig), 1841, new combination
Xystus femoralis Hartig, 1841:352.
Allotria (Allotria) Femoralis; Dallas Torre & Kieffer, 1902:40; Kieffer, 1904:50.
Charips (Charips) femoralis; Dalla Torre & Kieffer, 1910:275.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany.
Hosts: unknown.

Alloxysta filicornis (Cameron), 1889
Allotria filicornis Cameron, 1889:55; Cameron, 1890:251; Dalla Torre, 1893:32.
Dilyta filicornis; Kieffer, 1900:114.
Alloxysta (Alloxysta) filicornis; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:36; Dalla Torre & Kieffer, 1910:259.
Alloxysta filicornis; Hedicke, 1928:93.
Type: British Museum.
Distibution: England & Scotland.
Hosts: *Lycium europoeum/Aphis* sp.

Alloxysta filimentosus Andrews (*) (**)

Alloxysta flaviceps (Kieffer), 1902, new combination
Allotria (Allotria) flaviceps; Kieffer, 1902:15; Kieffer, 1904:69, Dalla Torre & Kieffer, 1902:40.
Charips (Charips) flaviceps; Dalla Torre & Kieffer, 1910:283.
Type: unknown.
Distribution: Germany.
Hosts: Roses/*Macrosiphum rosae.*

Alloxysta flavicornis (Hartig), 1841
Xystus flavicornis Hartig, 1841:352; Rondani, 1878:172.
Allotria flavicornis: Giraud, 1860:129; Taschenberg, 1866:129; Cameron, (1887) 1886:85; Cameron, 1889:54; Cameron, 1890:233; Dalla Torre, 1893:32; Kieffer, 1900:115.
Allotria (Allotria) flavicornis; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:66.
Charips (Charips) flavicornis: Dalla Torre & Kieffer, 1910:282.
Alloxysta flavicornis: Hellen, 1963:16.
Allotria (Allotria) macrocera; Thomson, 1877:814 (in part).
Allotria macrocera; Dalla Torre, 1893:-33.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England, France, Germany, Scotland & Sweden.
Hosts: *Carthamus tinctorius/Aphis carthami.*

Alloxysta forticornis (Giraud), 1860
Allotria forticornis Giraud, 1860:129; Tachenberg, 1866:129; Cameron, 1890:233; Dalla Torre, 1893:32.
Dilyta forticornis: Kieffer, 1900:114.
Alloxysta (Alloxysta) forticornis; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:43; Dalla Torre & Kieffer, 1910:262.
Alloxysta forticornis: Hellen, 1963:11.
Allotria basalis Thomson, 1862:408; Dalla Torre, 1893:30.
Type: Natural History Museum, Paris,

France.
Distribution: Austria, England, France, Germany & Sweden.
Hosts: *inus silvestris/Lachnus giraudi.*

Alloxysta fracticornis (Thomson), 1862, **new combination**
Allotria fracticornis Thomson, 1862:408; Dalla Torre, 1893:32.
Allotria (Allotria) fracticornis: Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:65.
Charips (Charips) fracticornis; Dalla Torre & Kieffer, 1910:281.
Type: Lund University Museum, Lund, Sweden.
Distribution: Austria & Sweden.
Hosts: unknown.

Alloxysta fulviceps (Curtis), 1838, **new combination**
Cynips fulviceps Curtis, 1838:688; Haliday, 1834:102; Buckton, 1874:150.
Allotria (Allotria) fulviceps; Kieffer, 1904:76; Dalla Torre & Kieffer, 1910:288.
Type: unknown.
Distribution: England.
Hosts: *Salix* spp. & parsnips/Aphids.

Alloxysta fusca (Dahlbom), 1842, **new combination**
Allotria fusca Dahlbom, 1842:table 4; Dalla Torre, 1893:32; Kieffer, 1904:77.
Type: unknown.
Distribution: Sweden.
Hosts: unknown.

Alloxysta fuscicornis (Hartig), 1841, new combination
Xystus fuscicornis Hartig, 1841:352.
Allotria fuscicornis: Taschenberg, 1866:130; Dalla Torre, 1893:32.
Allotria (Allotria) fuscicornis; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:60.
Charips (Charips) fuscicornis; Dalla Torre & Kieffer, 1910;279.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany.
Hosts: unknown.

Alloxysta fuscipes (Thomson), 1862
Allotria fuscipes Thomson, 1862:410; Cameron, 1884:267; Cameron, (1887) 1886:88; Dalla Torre, 1893:32.
Dilyta fuscipes; Kieffer, 1900:114.
Alloxysta (Alloxysta) fuscipes; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:41; Dalla Torre & Kieffer, 1910:260.
Alloxysta fuscipes; Hellen, 1931:4; Hellen, 1963:13; Weld, 1952:253.
Allotria crassa; Dalla Torre, 1893:31.
Alloxysta ruthei; Hellen, 1931:4.
Type: Lund University Museum, Lund, Sweden.
Distribution: Austria, England, Iceland & Sweden.
Hosts: *Salix aurita/Aphis* sp.

Alloxysta fuscitarsis Kieffer, 1903
Alloxysta fuscitarsis Kieffer, 1904:596; Dessart, 1969:190.
Alloxysta (Alloxysta) fuscitarsis; Kieffer, 1910;262.
Type: Natural History Museum, Amiens, Frances.
Distrtibution: France.
Hosts: unknown.

Alloxysta gautieri Kieffer, 1921
Alloxysta gautieri Kieffer, 1921:302; Weld, 1952:253.
Type: unknown.
Distribution: France.
Hosts: *Trioxys placidus.*

Alloxysta glebaria Hellen, 1963
Alloxysta glebaria Hellen, 1963:22.
Type: Helsingfors University Museum, Helsinki, Finland.
Distribution: Finland.
Hosts: unknown.

Alloxysta gracilis Baker, 1896 (*)(**)

Alloxysta grioti (de Santis), 1937, **new combination (**)**
Charips (Charips) grioti de Santis, 1937:14.
Charips grioti; Parker, Berry & Guide, 1953:26; Millan, 1956:269.
Type: Collection of the Facility of Agriculture, La Plata, Argentina.
Distribution: Argentina & Uruguay.
Hosts: *Aphidius platensis; Schizephis graminium.*

Alloxysta halli Andrews (*)(**)

Alloxysta halterata (Thomson), 1862
Allotria halterata Thomson, 1862:410; Cameron, (1887) 1886:88.

Pezophycta halterata; Kieffer, 1900:114; Dalla Torre & Kieffer, 1902:42; Kieffer, 1904:20; Dalla Torre & Kieffer, 1910:292.
Alloxysta halterata; Hellen, 1963:20.
Type: Lund University Museum, Lund, Sweden.
Distribution: England & Sweden.
Hosts: unknown.

Alloxysta hendricki (Benoit), 1956, **new combination**
Charips hendricki Benoit, 1956:438.
Type: female, kivu, Belgian Congo; Royal Museum of the Belgian Congo.
Distribution: Africa.
Hosts: unknown.

Alloxysta heptatoma Hellen, 1963
Alloxysta heptatoma Hellen, 1963:22.
Type: Helsingfors University Museum, Helsinki, Finland.
Distribution: Finland.
Hosts: unknown.

Alloxysta heterocera (Hartig), 1841, **new combination**
Xystus heterocerus Hartig, 1841:351; Thomson, 1862:407.
Allotria heterocerus; Taschenberg, 1866:129
Allotria heterocera; Cameron, 1890:234.
Dilyta heterocera: Kieffer, 1900:114.
Allotria (Allotria) heterocera: Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:50.
Charips (Charips) heterocerus; Dalla Torre & Kieffer, 1910:275.
Allotria minuta; Cameron, 1890:234; Della Torre, 1893:33.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England, Germany & Sweden.
Hosts: *Eryngium campestre* & *Rumex acetosella*/aphis: *Aphis viciae; Aphis plantaginis.*

Alloxysta ignorata (Kieffer), 1900
Dilyta ignorata: Kieffer, 1900:114.
Alloxysta (Alloxysta) ignorata: Kieffer, 1904:29; Dalla Torre & Kieffer, 1910:262.
Allotria testaceus (in part); Cameron, 1889:56.
Allotria testacea (in part); Cameron, 1890:234.
Alloxysta (Alloxysta) testacea; Dalla Torre & Kieffer, 1902:39.
Type: unknown.
Distribution: England.
Hosts: *Aphis chenopodii.*

Alloxysta islandica Hellen, 1931
Alloxysta islandica Hellen, 1931:5; Weld, 1952:253.
Type: Probably in Helsingfors University Museum, Helsinki, Finland.
Distribution: France.
Hosts: unknown.

Alloxysta japonicus (Ashmead), 1904, **new combination**
Xystus japonicus Ashmead, 1904:77.
Charips (Charips) japonicus; Dalla Torre & Kieffer, 1910:288.
Charips japonicus; Watanabe, 1950:86.
Type: male, labeled Japan, bred from aphis; Type No. 7137, USNM.
Distribution: Japan.
Hosts: Aphis.

Alloxysta kiefferi Picord, 1919
Alloxysta kiefferi Picord, 1919:239; Weld, 1952:253.
Type: unknown.
Distribution: France.
Hosts: unknown.

Alloxysta lachni (Ashmead), 1885 (*) (**)

Alloxysta leguminosa (Weld), 1920 (*) (**)

Alloxysta leunisii (Hartig), 1841, **new combination**
Xystus Leunisii Hartig, 1841:351.
Allotria Leunisii; Taschenberg, 1866:129.
Allotria leunisii; Dalla Torre, 1893:32.
Allotria (Allotria) Leunisi; Dalla Torre & Kieffer, 1902:40.
Allotria (Allotria) Leunisii; Kieffer, 1904:51.
Charips (Charips) leunisii; Dalla Torre & Kieffer, 1910:275.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany.
Hosts: unknown.

Alloxysta longicornis (Hartig), 1840, new combination
Xystus longicornis Hartig, 1840:199; Hartig, 1841:350.

Allotria longicornis; Taschenberg, 1866:129; Cameron, (1887) 1886:86; Cameron, 1889:55; Cameron, 1890:234; Dalla Torre, 1893:32; Kieffer, 1900:114.
Allotria (Allotria) longicornis; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:55.
Charips (Charips) longicornis; Dalla Torre & Kieffer, 1910:277.
Allotria (Allotria) teataceipes Kieffer, 1902:12.
Charips (Charips) testaceipes; Dalla Torre & Kieffer, 1910:277.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: England, Germany, Scotland & Sweden.
Hosts: *Nematus gallicolla*/Aphis; *Pontania Vallisnieri/Pemphigus gnaphalii.*

Alloxysta longipennis (Hartig), 1841
Xystus longipennis Hartig, 1841:352.
Allotria longipennis; Taschenberg, 1866:130; Dalla Torre, 1893:32.
Dilyta longipennis; Kieffer, 1900:114.
Alloxysta (Alloxysta) longipennis; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:31; Dalla Torre & Kieffer, 1910:256.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany.
Hosts: unknown.

Alloxysta longiventris Baker, 1896 (*) (**)

Alloxysta luteicornis lateralis (Kieffer), 1903, **new combination**
Allotria (Allotria) luteicornis lateralis Kieffer, 1904:70; Dessart, 1969:193.
Charips (Charips) luteicornis lateralis; Dalla Torre & Kieffer, 1910:283.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Medicago sativa/Aphis* sp.

Alloxysta luteicornis luteicornis (Kieffer), 1902, **new combination**
Allotria (Allotria) luteicornis Kieffer, 1902:15; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:67; Dessart, 1969:193.
Charips (Charips) luteicornis; Hedicke, 1928:93.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Medicago sativa & Lycium europoeum/Aphis* sp.

Alloxysta luteipes (Kieffer), 1902, **new combination**
Allotria (Allotria) luteipes; Kieffer, 1902:16; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:73.
Charips (Charips) luteipes; Dalla Torre & Kieffer, 1910:284.
Type: unknown.
Distribution: Germany.
Hosts: *Heracleum sphondylium/Aphis* sp.

Alloxysta macrophadna (Hartig), 1841
Xystus macrophadnus Hartig, 1841:352.
Allotria macrophadna; Giraud, 1860:130; Thomson, 1862:408; Taschenberg, 1866:129; Cameron, (1887) 1886:86; Cameron, 1890:251; Dalla Torre, 1893:33.
Alloxysta macrophadna; Foerster, 1869:340; Ashmead, 1903:142; Lameere, 1907:195; Hellen, 1931:4; Hellen, 1963:12.
Allotria macrophadnus; Cameron, 1889:55.
Dilyta macrophadnus; Kieffer, 1900:114.
Alloxysta (Alloxysta) macrophadna; Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:26; Dalla Torre & Kieffer, 1910:254; Hedicke, 1914:355.
Alloxysta macrophadnus; Rohwer & Fagan, 1917:340; Hellen, 1963:12; Weld, 1952:253.
Charips macrophadnus; Muesebeck, Krombein, Townes et al., 1951:607.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England, Germany, Scotland & Sweden.
Hosts: unknown.

Alloxysta maculicollis (Cameron), 1887
Allotria maculicollis Cameron, 1887:87; Cameron, 1889:55; Cameron, 1890:252; Dalla Torre, 1893:33.
Dilyta maculicollis; Kieffer, 1900:114.
Alloxysta (Alloxysta) maculicollis;

Dalla Torre & Kieffer, 1902:38; Kieffer, 1904:35; Dalla Torre & Kieffer, 1910:258.
Type: British Museum.
Distribution: England & Scotland.
Hosts: unknown.

Alloxysta marshalliana (Kieffer), 1900
Nephycta marshalliana Kieffer, 1900:114; Kieffer, 1904:21; Dalla Torre & Kieffer, 1910:290.
Nephycta Marshalliana; Dalla Torre & Kieffer, 1902:41.
Alloxysta marshalliana; Hellen, 1931:5.
Allotria brachyptera (in part); Cameron, 1886:88; Cameron, 1890:234; Dalla Torre, 1893:30.
Type: unknown.
Distribution: England, Germany, Scotland & Sweden.
Hosts: *Fraxinus/Pemphigus bumeliae.*

Alloxysta maxima Hedicke, 1914
Alloxysta maxima Hedicke, 1914:356; Weld, 1952:253.
Type: Four syntypes, Overhalden, Norway; Humbolt University Museum, Berlin, Germany.
Distribution: Norway.
Hosts: unknown.

Alloxysta megaptera (Cameron), 1886, **new combination**
Allotria megaptera Cameron, 1886:86; Cameron, 1889:54; Cameron, 1890:239; Dalla Torre & Kieffer, 1902:40.
Allotria (Allotria) megaptera; Kieffer, 1904:63–64.
Charips (Charips) magapterus; Dalla Torre & Kieffer, 1910:281.
Type: British Museum.
Distribution: England & Scotland.
Hosts: unknown.

Alloxysta megourae (Ashmead), 1887, **new combination** (*) (**)

Alloxysta melanogaster (Hartig), 1840
Xystus melanogaster Hartig, 1840:200; Hartig, 1841:350; Rondani, 1878:173.
Allotria melanogaster; Giraud, 1860:129; Taschenberg, 1866:129; Cameron, (1887) 1886:86; Cameron, 1890:234; Dalla Torre, 1893:33; Kieffer, 1900:115.
Allotria (Allotria) melanogaster; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:61.
Alletria melanogastra; Lameere, 1907:195.
Charips (Charips) melanogaster; Dalla Torre & Kieffer, 1910:279.
Alloxysta melanogaster; Hellen, 1963:21.
Allotria megaptera; Cameron, 1890:239; Dalla Torre, 1893:33.
Charips (Charips) megapterus; Dalla Torre & Kieffer, 1910:281.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England, France, Germany & Scotland.
Hosts: *Epilobium spicatum/Aphis craccae.*

Alloxysta minuscula Andrews (*) (**)

Alloxysta minuta (Hartig), 1840
Xystus minutus Hartig, 1840:200; Hartig, 1841:350; Rondani, 1878:172.
Allotria minuta; Giraud, 1860:127; Thomson, 1862:407; Taschenberg, 1866:129; Dalla Torre, 1893:33; Kieffer, 1900:115; Lameere, 1907:195.
Allotria (Allotria) minuta; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:53.
Charips (Charips) minutus; Dalla Torre & Kieffer, 1910:276; Belizin, 1928:-12.
Alloxysta minuta; Hellen, 1963:21.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Australia, England, Germany, Holland, Hungary & Sweden.
Hosts: *Eryngium campestre* & *Rumex Acetocella/Aphis* sp.

Alloxysta mullensis (Cameron), 1883, **new combination**
Allotria mullensis Cameron, 1883:366; Cameron, (1887) 1886:86; Cameron, 1889:55; Cameron, 1890:246; Dalla Torre, 1893:33.
Allotria (Allotria) Mullensis; Dalla Torre & Kieffer, 1902:40.
Allotria (Allotria) mullensis; Kieffer, 1904:72.
Charips (Charips) mullensis; Dalla Torre & Kieffer, 1910:284.
Type: British Museum.

Distribution: England, France & Scotland
Hosts: *Bupleurum falcatum*/Aphids.

Alloxysta musti (Rondani), 1875, **new combination**
Xystus musti Rondani, 1875:145; Weld, 1952:252.
Allotria mustii; Dalla Torre, 1893:34.
Eucoilidae musti; Kieffer, 1900:115.
Allotria (Allotria) musti; Dalla Torre & Kieffer, 1902:41.
Charips (Charips) musti; Dalla Torre & Kieffer, 1910:288.
Type: unknown.
Distribution: Italy.
Hosts: *Vitis vinifera*/*Aphis* sp.; *Drosophila uvarum; Drosophila oenopotae.*

Alloxysta nigricans Hellen, 1963
Alloxysta nigricans Hellen, 1963:16.
Type: Helsingfors University Museum, Helsinki, Finland.
Distribution: Finland.
Hosts: unknown.

Alloxysta nigrita (Thomson), 1862
Allotria nigrita Thomson, 1862:409; Dalla Torre, 1893:34.
Dilyta nigrita; Kieffer, 1900:114.
Alloxysta (Alloxysta) nigrita; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:43; Dalla Torre & Kieffer, 1910:262
Type: Lund University Museum, Lund, Sweden.
Distribution: France & Sweden.
Hosts: *Sonchus asper/aphid* sp.

Alloxysta nigriventris nigriventris (Thomson), 1862
Allotria nigriventris Thomson, 1862:409; Cameron, 1889:56; Cameron, 1890:256; Dalla Torre, 1893:-34.
Dilyta nigriventris; Kieffer, 1900:114.
Alloxysta (Alloxysta) nigriventris; Dalla Torre & Kieffer, 1902:39.
Alloxysta (Alloxysta) nigriventris nigriventris; Kieffer, 1904:33; Dalla Torre & Kieffer, 1910:256.
Type: Lund University Museum, Lund, Sweden.
Distribution: England, Scotland & Sweden.
Hosts: unknown.

Alloxysta nigriventris rubromaculata Kieffer, 1902
Alloxysta nigriventris rubromaculata Kieffer, 1902:10.
Alloxysta (Alloxysta) nigriventris rubromaculata; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:31; Dalla Torre & Kieffer, 1910:257.
Allotria nigriventris rubromaculata; Hedicke, 1928:93.
Type: unknown.
Distribution: England.
Hosts: unknown.

Alloxysta obscurata (Hartig), 1840
Xystus obscuratus Hartig, 1840:200; Hartig, 1841:351.
Allotria obscuratus; Taschenberg, 1866:130.
Alletria obscurata; Dalla Torre, 1893:34.
Dilyta obscurata; Kieffer, 1900:114.
Alloxysta (Alloxysta) obscurata; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:42; Dalla Torre & Kieffer, 1910:261.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany & Iceland.
Hosts: *Pontania Vallisnieri/Aphis* sp.

Alloxysta orthocera (Kieffer), 1902, **new combination**
Allotria orthocera Kieffer, 1902:14.
Allotria (Allotria) orthocera; Dalla Torre & Kieffer, 1902:40; Kieffer, 1903:66.
Charips (Charips) orthocerus; Dalla Torre & Kieffer, 1910:282.
Type: unknown.
Distribution: France.
Hosts: *Artemisia vulgaris/Aphis gallarum*

Alloxysta parvicellula (Kieffer), 1903, **new combination**
Allotria (Allotria) parvicellula Kieffer, 1904:601; Dessart; 1969:195.
Charips (Charips) parvicellula; Dalla Torre & Kieffer, 1910:286.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: unknown.

Alloxysta patens Hellen, 1963
Alloxysta patens Hellen, 1963:15.

Type: Helsingfors University Museum, Helsinki, Finland.
Distribution: Finland.
Hosts: unknown.

Alloxysta pedestris (Curtis), 1838
Cynips pedestris Curtis, 1838:688.
Allotria pedistris; Cameron, (1887) 1886:88; Cameron, 1890:234; Dalla Torre, 1893:34.
Nephycta pedestris; Kieffer, 1900:114; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:22; Dalla Torre, 1910:291.
Alloxysta pedestris; Hellen, 1963:19.
Type: unknown.
Distribution: Austria, Denmark, England, Germany & Scotland.
Hosts: *Daucus carota*/aphis.

Alloxysta perplexa (Cameron), 1889
Allotria perplexa Cameron, 1889:58; Cameron, 1890:254; Dalla Torre, 1893:34.
Dilyta perplexa; Kieffer, 1900:114.
Alloxysta (Alloxysta) perplexa; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:40; Dalla Torre & Kieffer, 1910:261.
Alloxysta perplexa; Hellen, 1931:4; Hellen, 1963:12.
Type: British Museum.
Distribution: England & Scotland.
Hosts: unknown.

Alloxysta perpusilla (Kieffer), 1903: **new combination**
Allotria (Allotria) perpusilla Kieffer, 1904:598; Dessart, 1969:196.
Charips (Charips) perpusillus; Dalla Torre & Kieffer, 1910:287.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Conium maculatum*/*Aphis* sp.

Alloxysta piceomaculata (Cameron), 1883
Allotria piceomaculata Cameron, 1883:-367; Cameron, (1887) 1886:88; Cameron, 1889:56; Cameron, 1890:258; Dalla torre, 1893:34.
Dilyta piceomaculata; Kieffer, 1900:114.
Alloxysta (Alloxysta) piceomaculata; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:32; Dalla Torre & Kieffer, 1910:256.
Alloxysta piceomaculata; Hellen, 1963:-13.
Type: British Museum.
Distribution: England & Scotland.
Hosts: unknown.

Alloxysta pilipennis (Hartig), 1840
Xystus pilipennis Hartig, 1840:199; Hartig, 1841:350.
Allotria pilipennis; Thomson, 1862:406; Taschenberg, 1866:130; Cameron, 1890:234; Dalla Torre, 1893:34; Kieffer, 1900:114.
Allotria (Allotria) pilipennis; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:68.
Charips (Charips) pilipennis; Dalla Torre & Kieffer, 1910:283.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany & Sweden.
Hosts: *Pontania Vallisnieri*/aphis.

Alloxysta pleuralis (Cameron), 1879, **new combination**
Allotria pleuralis Cameron, 1879:113; Cameron, (1887) 1886:85; Cameron, 1889:54; Cameron, 1890:240; Dalla Torre, 1893:34.
Allotria (Allotria) pleuralis; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:61.
Charips (Charips) pleuralis; Dalla Torre & Kieffer, 1910:279.
Type: British Museum.
Distribution: England & Scotland.
Hosts: unknown.

Alloxysta postica (Hartig), 184[illegible]
Xystus posticus Hartig, 1841:352; Rondani, 1878:176.
Allotria posticus; Taschenberg, 1866:130.
Allotria postica; Cameron, 1890:234; Dalla Torre, 1893:35.
Dilyta posticus; Kieffer, 1900:114.
Alloxysta (Alloxysta) postica; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:34; Dalla Torre & Kieffer, 1910:257.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany.
Hosts: *Aphis aparines.*

Alloxysta pruni (Hedicke), 1928, **new combination**

Charips (Charips) pruni Hedicke, 1928:94.
Charips pruni; Weld, 1952:252.
Type: Natural History Museum, Hamburg, Germany.
Distribution: Germany.
Hosts: unknown.

Alloxysta pusilla melanothorax (Kieffer), 1902, **new combination**
Allotria (Allotria) pusilla melanothorax Kieffer, 1902:14; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:71; Dessart, 1969:192.
Charips (Charips) pusilla melanothorax; Dalla Torre & Kieffer, 1910:280.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Barbarea praecox* & *Alisma Plantago/Aphis* sp.

Alloxysta pusilla pusilla (Kieffer), 1902, **new combination**
Allotria (Allotria) pusilla pusilla Kieffer, 1902:13; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:62; Dessart, 1969:192.
Charips (Charips) pusillus pusillus; Dalla Torre & Kieffer, 1910:279.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Chrysanthemum Leucanthemum, Salix viminalis* & *Populus alba/Aphis* sp.

Alloxysta pusilla unicolor (Kieffer), 1902, **new combination**
Allotria (Allotria) pusilla unicolor Kieffer, 1902:13; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:60; Dessart, 1969:192.
Charips (Charips) pusillus unicolor; Dalla Torre & Kieffer, 1910: 280.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Alisma Plantago/*aphids.

Alloxysta quebeci Andrews (*) (**)

Alloxysta quedenfeldti (Kieffer), 1909, *new combination*
Charips quedenfeldti Kieffer, 1909:482; Weld, 1952:252.
Type: unknown.
Distribution: Algeria.
Hosts: unknown.

Alloxysta ramulifera (Thomson), 1862
Allotria ramulifera Thomson, 1862:407.
Allotria (Allotria) ramulifera; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:65; Dalla Torre, 1893:35.
Charips (Charips) ramulifera; Dalla Torre & Kieffer, 1910:281.
Alloxysta ramulifera; Hellen, 1963:20.
Type: Lund University Museum, Lund, Sweden.
Distribution: Germany & Sweden.
Hosts: unknown.

Alloxysta rauchi Andrews (*) (**)

Alloxysta recticornis atra (Kieffer), 1902, **new combination**
Allotria (Allotria) recticornis atra Kieffer, 1902:13; Dalla Torre & Kieffer, 1902:41; Kieffer, 1903:59.
Charips (Charips) recticornis atra; Dalla Torre & Kieffer, 1910:278.
Type: unknown.
Distribution: France.
Hosts: *Lycium europoeum/Aphis* sp.

Alloxysta recticornis recticornis (Kieffer), 1902, **new combination**
Allotria (Allotria) recticornis recticornis Kieffer, 1902:12; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:58; Dessart, 1969:191.
Charips (Charips) recticornis recticornis; Dalla Torre & Kieffer, 1910:278.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Platanus* sp., *Alisma plantago* & *Aegopodium Podagraria/Aphis* sp.

Alloxysta rubriceps (Kieffer), 1902, **new combination**
Allotria (Allotria) rubriceps Kieffer, 1902:14; Dalla Torre & Kieffer, 1904:67.
Charips (Charips) rubriceps; Dalla Torre & Kieffer, 1910:282.
Type: unknown.
Distribution: France.
Hosts: *Phragmites communis*/a coccid.

Alloxysta ruficollis (Cameron), 1883, **new combination**

Allotria ruficollis Cameron, 1883:365; Cameron, (1887) 1886:85; Cameron, 1889:54; Cameron, 1890:241; Dalla Torre, 1893:35.
Allotria (Allotria) ruficollis; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:62.
Charips (Charips) ruficollis; Dalla Torre & Kieffer, 1910:280.
Type: British Museum.
Distribution: England & Scotland.
Hosts: unknown.

Alloxysta rufiventris (Hartig), 1840
Xystus rufiventris Hartig, 1840:200; Hartig, 1841:351.
Allotria rufiventris; Taschenberg, 1866:-130; Dalla Torre, 1893:35.
Dilyta rufiventris; Kieffer, 1900:114.
Alloxysta (Alloxysta) rufiventris; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:30; Dalla Torre & Kieffer, 1910:255.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany.
Hosts: unknown.
Alloxysta schlingeri Andrews (*) (**)

Alloxysta scutellata Kieffer, 1902
Alloxysta scutellata Kieffer, 1902:9; Dessart, 1969:189.
Alloxysta (Alloxysta) scutellatea; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:28; Dalla Torre & Kieffer, 1910:255.
Allotria scutellata; Hedicke, 1928:93.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Medicago sativa* & *Trifolium pratense/Aphis medicaginis.*

Alloxysta semiclausa Kieffer, 1903
Alloxysta semiclausa Kieffer, 1904:595.
Alloxysta (Alloxysta) semiclausa; Dalla Torre & Kieffer, 1910:263.
Type: unknown.
Distribution: France.
Hosts: unknown.

Alloxysta silvicola (Belizin), 1928, new combination
Charips (Charips) silvicoloa Belizin, 1928:12.
Charips silvicola; Weld, 1952:253.
Type: Moscow?
Distribution: Soviet Union.
Hosts: unknown.

Alloxysta simplex (Watanabe) 1950, new combination
Charips simplex Watanabe, 1950:83; Weld, 1952:253.
Type: Holotype, Allotype and 27 paratypes in Entomological Institute, Hokkaido University, Sapporo, Japan.
Distribution: Japan.
Hosts: *Ampohrophera magnoliae/Praon volucris; amphorophera indica/Praon longicornis.*

Alloxysta silvestrii (Kieffer), 1908, new combination
Auloxysta silvestrii Kieffer, 1908:66.
Charips silvestrii; Weld, 1952:252.
Type: unknown.
Distribution: Italy.
Hosts: unknown.

Alloxysta soluta Hellen, 1963
Alloxysta soluta Hellen, 1963:10.
Type: Helsingfors University Musuem, Helsinki, Finland.
Distribution: Finland.
Hosts: unknown.

Allexysta subaperta Kieffer, 1903
Alloxysta subaperta Kieffer, 1904
Alloxysta subaperta Kieffer, 1904:595; Hellen, 1931:5; Dessart, 1969:190.
Alloxysta (Alloxysta) subaperta; Dalla Torre & Kieffer, 1910:263.
Type: Natural History Musuem, Amiens, France.
Distribution: France.
Hosts: unknown.

Alloxysta testaceipes (Kieffer), 1902, new combination
Allotria longicornis (in part); Thomson, 1862:407.
Allotria (Allotria) testaceipes Kieffer, 1902:10; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:56.
Charips (Charips) testaceipes; Dalla Torre & Kieffer, 1910:277.
Type: Lund University Museum, Lund, Sweden.
Distribution: Germany & Sweden.
Hosts: *Nematus gallicola/*aphis.

Alloxysta testacea (Hartig), 1841, new combination

Xystus testaceus Hartig, 1841:352; Rondani, 1878:171.
Allotria testacea; Giraud, 1860:129; Taschenberg, 1866:129; Dalla Torre & Kieffer, 1893:35.
Allotria (Allotria) testacea; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:59.
Charips (Charips) testaceus; Dalla Torre & Kieffer, 1910:279.
Dilyta ignorata; Kieffer, 1900:114.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England & Germany.
Hosts: unknown.

Alloxysta transeins Kieffer, 1902
Alloxysta transiens Kieffer, 1902:10.
Alloxysta (Alloxysta) transiens; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:27; Dalla Torre & Kieffer, 1910:255; Dessart, 1969:189.
Type: Natural History Musuem, Amiens, France.
Distribution: France.
Hosts: *Alnus glutinosa*/aphids.

Alloxysta trapezoidea (Hartig), 1841
Xystus trapezoideus Hartig, 1841:352.
Allotria trapezoideus; Taschenberg, 1866:130.
Allotria trapezoidea; Cameron, 1884:267; Cameron, 1889:55; Cameron, 1890:255; Dalla Torre, 1893:-35.
Dilyte trapezoidea; Kieffer, 1900:114.
Alloxysta (Alloxysta) trapezoidea; Kieffer; 1904:39; Dalla Torre & Kieffer, 1902:39; Dalla Torre & Kieffer, 1910:260.
Alloxysta (Alloxysta) defecta; Dalla Torre & Kieffer, 1910:259.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Austria, England, Germany & Scotland.
Hosts: unknown.

Alloxysta tricolor (Kieffer), 1902, **new combination**
Allotria tricolor Kieffer, 1902:14; Dessart, 1969:192.
Allotria (Allotria) tricolor; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:64.
Charips (Charips) tricolor; Dalla Torre & Kieffer, 1910:281; Hedicke, 1928:93.
Type: Natural History Musuem, Amiens, France.
Distribution: France.
Hosts: *Salix* sp./aphids.

Alloxysta tscheki (Giraud), 1860
Allotria Tscheki Giraud, 1860:128; Taschenberg, 1866:129; Cameron, 1879:114; Cameron, (1887) 1886:85; Cameron, 1889:54; Cameron, 1890:233; Kieffer, 1900:115; Lameere, 1907:195.
Allotria tschekii; Dalla Torre, 1893:35.
Allotria (Allotria) Tscheki; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:74.
Charips (Charips) tscheki; Dalla Torre & Kieffer, 1910:285.
Charips tscheki; Dunn, 1949:106.
Alloxysta tscheki; Hellen, 1963:18.
Type: unknown.
Distribution: England & Western Europe.
Hosts: *Ribes rubrum/Aphis* sp.; *Acer Pseudoplatus/Drepanosiphus platanoides.*

Alloxysta ullrichi homotoma Kieffer, 1903
Alloxysta ullrichi homotoma Kieffer, 1904:597; Dessart, 1969:190.
Alloxysta (Alloxysta) ullrichi homotoma; Dalla Torre & Kieffer, 1910:259.
Type: Natural History Musuem, Amiens, France.
Distribution: France.
Hosts: unknown.

Alloxysta ullrichi ullrichi (Giraud), 1860
Allotria Ullrichi Giraud, 1860:130; Taschenberg, 1866:129; Cameron, 1889:59; Cameron, 1890:253.
Allotria obscurata; Cameron, (1887) 1886:88; Cameron, 1890:234.
Allotria ullrichii; Dalla Torre, 1893:35.
Dilyata Ullrichi; Kieffer, 1900:114.
Alloxysta (Alloxysta) Ullrichii; Dalla Torre & Kieffer, 1902:39.
Alloxysta (Alloxysta) Ullrichi; Kieffer, 1904:44.
Alloxysta (Alloxysta) ullrichi ullrichi; Dalla Torre & Kieffer, 1910:259.
Type: unknown.
Distribution: Austria, England, & Scotland.

Hosts: *Nematus gallicola.*

Alloxysta urticarum (Kieffer), 1902, **new combination**
Allotria urticarum Kieffer, 1902:12.
Allotria (Allotria) urticarum; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:57.
Charips (Charips) urticarum; Dalla Torre & Kieffer, 1910:278.
Type: unknown.
Distribution: Germany.
Hosts: *Aphis urticaria.*

Alloxysta vagans Kieffer, 1901 (*)

Alloxysta vandenboschi Andrews (*) (**)

Alloxysta versicolor (Kieffer), 1903, **new combination**
Allotria (Allotria) versicolor Kieffer, 1904:599; Dessart, 1969:195.
Charips (Charips) versicolor; Dalla Torre & Kieffer, 1910:287; Belizin, 1928:12.
Alloxysta crassicornis; Hellen, 1963:19.
Type: Natural History Museum, Amiens, France.
Distribution: Finland, France & Sweden.
Hosts: unknown.

Alloxysta victrix grandicornis (Kieffer), 1903, **new combination**
Allotria (Allotria) victrix grandicornis Kieffer, 1904:600; Dessart, 1969:193.
Charips (Charips) victrix grandicornis; Dalla Torre & Kieffer, 1910:286.
Type: Natural History Musuem, Amiens, France.
Distribution: France.
Hosts: unknown.

Alloxysta victrix infuscata (Kieffer), 1902 **new combination**
Allotria (Allotria) victrix infuscata Kieffer, 1902:16; Dalla Torre & Kieffer, 1902: 41; Kieffer, 1903:75; Dessart, 1969:194
Charips (Charips) victrix infuscatus; Dalla Torre & Kieffer, 1910:285.
Type: Natural History Musuem, Amiens, France.
Distribution: France.
Hosts: *Sinapis alba/Aphis* sp.

Alloxysta victrix luteiceps (Keiffer), 1902, **new combination**
Allotria (Allotria) victrix luteiceps Kieffer, 1902:16; Dalla Torre & Keiffer, 1902:41; Kieffer, 1903:74; Dessart, 1969:194.
Charips (Charips) victrix luteiceps; Dalla Torre & Keiffer, 1910:285; Hedicke, 1928:94.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Salix* sp./*Aphis* sp.

Alloxysta victrix victrix (Westwood), 1833
Allotria victrix Westwood, 1833:495; Giraud, 1860:127; Taschenberg, 1866:129; Foerster, 1869:340; Buckton, 1874:153; Cameron, (1887) 1886:85; Cameron, 1889:54; Cameron, 1890:242; Dalla Torre, 1893:36; Kieffer, 1900:115; Lameere, 1907:195.
Xystus victrix; Rondani, 1878:177; Ashmead, 1903:142.
Allotria (Allotria) victrix; Dalla Torre & Keiffer, 1902:41; Kieffer, 1904:75.
Charips (Charips) victrix; Dalla Torre & Kieffer, 1910:285; Haviland, 1921:452; Hedicke, 1928:94.
Charips victrix; Rohwer & Fagan, 1917:360; Muesebeck, Krombein, Townes et al., 1951:607; Weld, 1952:251.
Alloxysta victrix; Hellen, 1963:116.
Charips victrix infuscatus; Dunn, 1949:-106.
Cynips ruficeps; Zetterstedt, 1838:410.
Xystus erythrocephalus; Hartig, 1840:199.
Allotria erythrocephalus; Dahlbom, 1842:table 2:3; Thomson, 1862:406; Schlechtendal, 1875:160.
Type: Hope University Museum, Oxford, England.
Distribution: Austria, England, France, Holland, Hungary, Germany, Lappland, Scotland & Sweden, North America.
Hosts: Roses/*Aphis rosae;* Water lily/*Rhopalosiphium nymphaeae; Artemisia vulgaris/Aphis gallarum; Aphis viciae; Aphis ligustri.*

Alloxysta villosa (Hartig), 1841
Xystus villosus Hartig, 1841:353.

Allotria villosus; Taschenberg, 1866:130.
Allotria villosa; Dalla Torre, 1893:36.
Dilyta villosa; Kieffer, 1900:114.
Alloxysta (Alloxysta) villosa; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:40; Dalla Torre & Kieffer, 1910:260.
Type: Zoologische Sammlung des Bayerischen Staates, Munich, Germany.
Distribution: Germany
Hosts: unknown.

Alloxysta xanthocera (Thomson), 1862
Allotria xanthocera Thomson, 1862:407; Dalla Torre, 1893:36.
Allotria (Allotria) xanthocera; Dalla Torre & Kieffer, 1902:41; Kieffer, 1904:67.
Charips (Charips) xanthocerus; Dalla Torre & Kieffer, 1910:282.
Alloxysta xanthocera; Hellen, 1963:18.
Allotria macrocera; Thomson, 1877:814 (in part).
Type: Lund University Museum, Lund, Sweden.
Distribution: Sweden.
Hosts: unknown.

Alloxysta xanthopa (Thomson), 1862
Allotria xanthopa Thomson, 1862:408; Dalla Torre, 1893:36.
Dilyta xanthopa; Kieffer, 1900:114.
Alloxysta (Alloxysta) xanthopa; Dalla Torre & Kieffer, 1902:39; Kieffer, 1904:36; Dalla Torre & Kieffer, 1910:260.
Type: Lund University Museum, Lund, Sweden.
Distribution: Sweden.
Hosts: unknown.

Alloxysta xanthopsis (Ashmead), 1896 (*) (**)

HEMICRISIS Foerster, 1869

Hemicrisis ruficornis Foerster, 1869 (*) (**)

LYTOXYSTA Kieffer, 1909

Lytoxysta brevipalpis Kieffer, 1909 (*) (**)

PHAENOGLYPHIS Foerster, 1869

Phaenoglyphis abbreviata (Thomson), 1877
Allotria (Auloxysta) abbreviata Thomson, 1877:812.
Allotria abbreviata; Dalla Torre, 1893:-29
Hemicrisis abbreviata; Kieffer, 1900:113.
Phaenoglyphis abbreviata; Dalla Torre & Kieffer, 1902:42; Kieffer, 1904:11; Dalla Torre & Kieffer, 1910:295; Hellen, 1959:66.
Phaenoglyphis (Phaenoglyphis) abbreviata; Hellen, 1963:7.
Type: one syntype, Smaland, Sweden; Lund University Museum, Lund, Sweden.
Distribution: Finland & Sweden.
Hosts: unknown.

Phaenoglyphis africana (Benoit), 1956, **new combination**
Alloxysta africana Benoit, 1956:439.
Type: Royal Museum of the Belgian Congo.
Distribution: Belgian Congo.
Hosts: unknown.

Phaenoglyphis ambrosiae (Ashmead), 1897 (*) (**)

Phaenoglyphis americana Baker, 1896 (*) (**)

Phaenoglyphis bangalorensis Chandri

Kurian, 1953
Phaenoglyphis bangalorensis Chandri Kurian, 1953:113.
Type: Holotype and 5 paratype female specimens labeled: Ex *chilomenes sexmaculata,* Bangalore, August 1952, Coll. G. P. Channabasavanna; Agra University Museum.
Distribution: India.
Hosts: *Chilomenes sexmaculata* (Coccinellidae). This record is probably in error, as all known hosts are hymenopterous aphid parasites.

Phaenoglyphis calverta Andrews (*) (**)

Phaenoglyphis carpentieri Kieffer, 1902
Allotria (Bothrioxysta) carpentieri Kieffer, 1902:11; Kieffer, 1903:46; Dalla Torre & Kieffer, 1910:268; Dessart, 1969:190.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: "Aphis on *Sonchus*".

Phaenoglyphis collina (Cameron), 1889, **new combination** (**)
Allotria collina Cameron, 1889:57; Cameron, 1890:247; Dalla Torre, 1893:31.
Allotria (Allotria) collina; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:63.
Charips (Charips) collinus; Dalla Torre & Kieffer, 1910:280.
Type: One Specimen in the Cameron Collection labeled: Mugdock, 28-5, Cameron; British Museum.
Distribution: England.
Hosts: unknown.

Phaenoglyphis curvata (Kieffer), 1902, **new combination**
Allotria (Bothrioxysta) curvata Kieffer, 1902:12; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:47; Dessart 1969:191.
Charips (Bothrioxysta) curvatus; Kieffer, 1910:269; Haviland, 1921:452.
Type: Natural History Museum, Amiens, France.
Distribution: France & England.
Hosts: *Sinapis alba/Aphis.*

Phaenoglyphis falcata Andrews (*) (**)

Phaenoglyphis forticornis Cameron, 1888
Phaenoglyphis forticornis Cameron, 1888:210; Cameron, 1890:237; Dalla Torre, 1893:36; Kieffer, 1900:113; Dalla Torre & Kieffer, 1902:42; Kieffer, 1904:13; Dalla Torre & Kieffer, 1910:294.
Type: unknown.
Distribution: England.
Hosts: unknown.

Phaenoglyphis foveigera (Kieffer), 1902, **new combination**
Allotria (Bothrioxysta) foveigera Kieffer, 1902:11; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:47; Dessart, 1969:191.
Charips (Bothrioxysta) foveigera; Dalla Torre, 1910:268.
Type: Natural History Museum, Amiens, France.
Distribution: France.
Hosts: *Sinapis alba/Aphis* sp.

Phaenoglyphis fuscicornis (Thomson), 1877
Allotria (Auloxysta) fuscicornis Thomson, 1877:813.
Allotria lundensis Dalla Torre, 1893:32.
Phaenoglyphis fuscicornis; Kieffer, 1900:113; Dalla Torre & Kieffer, 1902:42; Kieffer, 1904:16, 592; Dalla Torre & Kieffer, 1910:295; Hellen, 1959:66.
Phaenoglyphis (Phaenoglyphis) fuscicornis; Hellen, 1963:6.
Type: 4 syntypes labeled Lund; Lund University Museum, Lund, Sweden.
Distribution: Sweden.
Hosts: unknown.

Phaenoglyphis gutierrezi Andrews (*) (**)

Phaenoglyphis helleni Andrews New Name
Phaenoglyphis carpentieri Kieffer, 1904:592; Dalla Torre & Kieffer, 1910:295; Hellen, 1959:66; Dessart, 1969:188.
Transference of *Allotria (Bothrioxysta) caprenteri* Kieffer, 1902, a senior homonym, into *Phaenoglyphis* necessitates a new name.
I propose *P. helleni* for Dr. Wolter Hellen.
Type: Natural History Museum, Ami-

ens, France.
Distribution: France.
Hosts: unknown.

Phaenoglyphis heraclei Dettmers, 1925
Phaenoglyphis heraclei Dettmers, 1925:-124; Weld, 1952:255.
Type: Dettmers collection; repository unknown.
Distribution: Netherlands.
Hosts: *Heracleum sphondylium.*

Phaenoglyphis laevigata (Bréthes), 1913, **new combination**
Charipsella laevigata BrÈthes, 1913a:200; 1913b:159; Rohwer & Fagan, 1919:238; Weld, 1952:255.
Type: Probably in Santiago, Chile, but may be in Argentina.
Distribution: Chile.
Hosts: unknown.

Phaenoglyphis laevis Andrews (*) (**)

Phaenoglyphis longicornis Hedicke, 1928

Phaenoglyphis longicornis Hedicke, 1928:-95; Weld, 1952:255. Type: Hamburg, Germany. Distribution: Germany. Hosts: unknown.

Phaenoglyphis nigripes (Thomson), 1877
Allotria (Auloxysta) nigripes Thomson, 1877:813.
Allotria nigripes; Dalla Torre, 1893:34.
Allotria (Bothrioxysta) nigripes; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:46?
Auloxysta nigripes; Ashmead, 1903:142.
Charips (Bothrioxysta) nigripes; Dalla Torre & Kieffer, 1910:268.
Bothrioxysta nigripes; Rohwer & Fagan, 1917:362.
Phaenoglyphis nigripes; Rohwer & Fagan, 1919:237; Hellen, 1959:67.
Charips nigripes: Muesebeck et al., 1951:607; Weld, 1952:252.
Phaenoglyphis (Auloxysta) nigripes; Hellen, 1963:7.
Type: One specimen, labeled: Smaland, Ryd., with circular red label bearing inscription "Weld 1931"; Lund University Museum, Lund, Sweden.
Distribution: Sweden.
Hosts: unknown.

Phaenoglyphis numidica (Kieffer), 1909, **new combination**
Bothrioxysta numidica Kieffer, 1909:482.
Charips numidica; Weld, 1952:252.
Type: Berlin.
Distribution: Algeria.
Hosts: unknown.

Phaenoglyphis pecki Andrews (*) (**)

Phaenoglyphis piciceps Thomson, 1862
Allotria piciceps Thomson, 1862:409; Dalla Torre, 1893:34.
Allotria (Bothrioxysta) picipes; Dalla Torre & Kieffer, 1902:40; Kieffer, 1904:48 (lapsus).
Charips (Bothrioxysta) piciceps; Dalla Torre & Kieffer, 1910:268.
Phaenoglyphis piceiceps; Hellen, 1959:67 (lapsus); Hellen, 1963:7 (lapsus).
Allotria perplexa Cameron, 1889:58 (in part, males only); Cameron, 1890:-254 (in part, males only); Dalla Torre, 1893:34.
Alloxysta (Alloxysta) perplexa; Kieffer, 1903:40; Dalla Torre & Kieffer, 1910:261.
Type: Six syntypes, Lund; Lund University Museum, Lund, Sweden.
Distribution: England, Finland, France, Italy and Sweden.
Hosts: unknown.
Remarks: The original description of Cameron's *Allotria perplexa* is a composite description of an *Alloxysta* female and a *Phaenoglyphis* male; the male series in his collection is composed of six *Phaenoglyphis* and one *Alloxysta* that in size, color and general facies seems to be the male *perplexa.* The males are referable to *Phaenoglyphis piciceps.*

Phaenoglyphis pilosus Andrews (*) (**)

Phaenoglyphis pubicollis (Thomson), 1877
Allotria (Auloxysta) pubicollis Thomson, 1877:812.
Allotria pubicollis; Dalla Torre, 1893:35.
Hemicrisis pubicollis; Kieffer, 1900:113.
Phaenoglyphis pubicollis; Dalla Torre & Kieffer, 1902:42; Kieffer, 1904:16; Dalla Torre & Kieffer, 1910:295.
Type: Female, Jemtland, Sweden; Lund

University Museum, Lund, Sweden.
Distribution: Sweden.
Hosts: unknown.

Phaenoglyphis salicis (Cameron), 1883
Allotria salicis Cameron, 1883:367.
Hemicrisis salicis; Cameron, (1887) 1886:89; Kieffer, 1900:113.
Phaenoglyphis salicis; Cameron, 1888:210; Cameron, 1890:237; Dalla Torre, 1893:37; Dalla Torre & Kieffer, 1902:42; Kieffer, 1904: 16; Dalla Torre & Kieffer, 1910:295.
Type: Two syntypes, a male labeled Gavilon and a female which is unlabeled but must be the type, as the original description is of a female; British Museum.
Distribution: England.
Hosts: *Salix pentandra*/a black *Aphis.*

Phaenoglyphis stenos Andrews (*) (**)

Phaenoglyphis stricta (Thomson), 1877
Allotria (Auloxysta) stricta Thomson, 1877:812.
Allotria stricta; Dalla Torre, 1893:35.
Phaenoglyphis stricta; Kieffer, 1900:113; Kieffer, 1904:15; Dalla Torre & Kieffer, 1910:294; Rohwer & Fagan, 1917:362; Rohwer & Fagan, 1919:237; Hellen, 1959:66; Hellen, 1963:6.
Phaenoglyphis striata; Dalla Torre & Kieffer, 1902:42 (lapsus).
Charips stricta; Weld, 1952:252.
Type: one female syntype labeled Skalstugan, lug. Alp. Jemtl., 16–21 40; Lund University Museum, Lund, Sweden.
Distribution: England ?, Finland, France, Germany ? & Sweden.
Hosts: unknown.

Phaenoglyphis xanthochroa Foerster, 1869
Phaenoglyphis xanthochroa Foerster, 1869:339; Cameron, 1888:211; Cameron, 1890:236; Dalla Torre, 1893:37; Kieffer, 1900:113; Dalla Torre & Kieffer, 1902:42; Ashmead, 1903:142; Kieffer, 1904:14; Dalla Torre & Kieffer, 1910:294; Rohwer & Fagan, 1919:373; Muesebeck et al., 1951:608; Weld, 1952:255; Hellen, 1959:66; Hellen, 1963:6.
Allotria (Auloxysta) rufa; Thomson, 1877:812.
Phaenoglyphis obfuscata; Kieffer, 1902:-16; Dalla Torre & Kieffer, 1902:42; Kieffer, 1904:14; Dalla Torre & Kieffer, 1910:294; new synonymy.
Type: One female labeled Luttich and with a small red circle inscribed "Weld 1931"; Humboldt University Museum.
Distribution: England, Finland, France, Germany & Sweden.
Hosts: Unknown.

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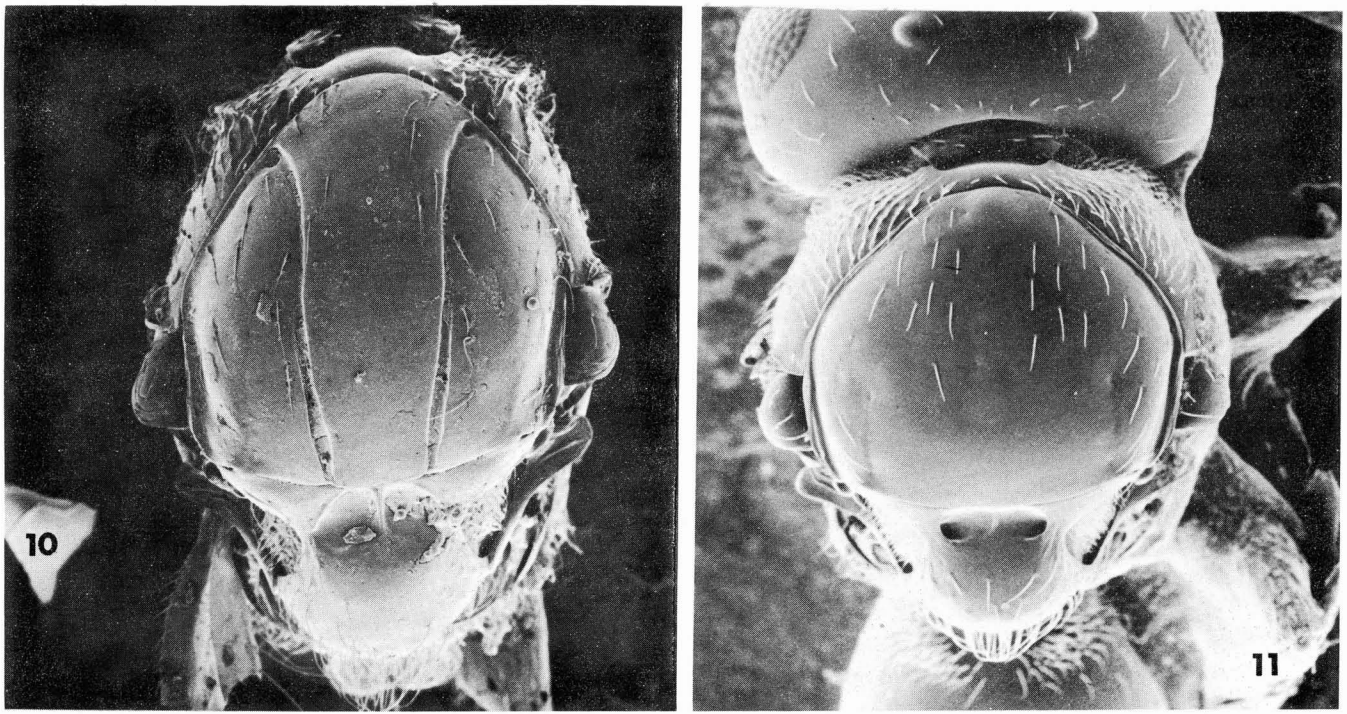
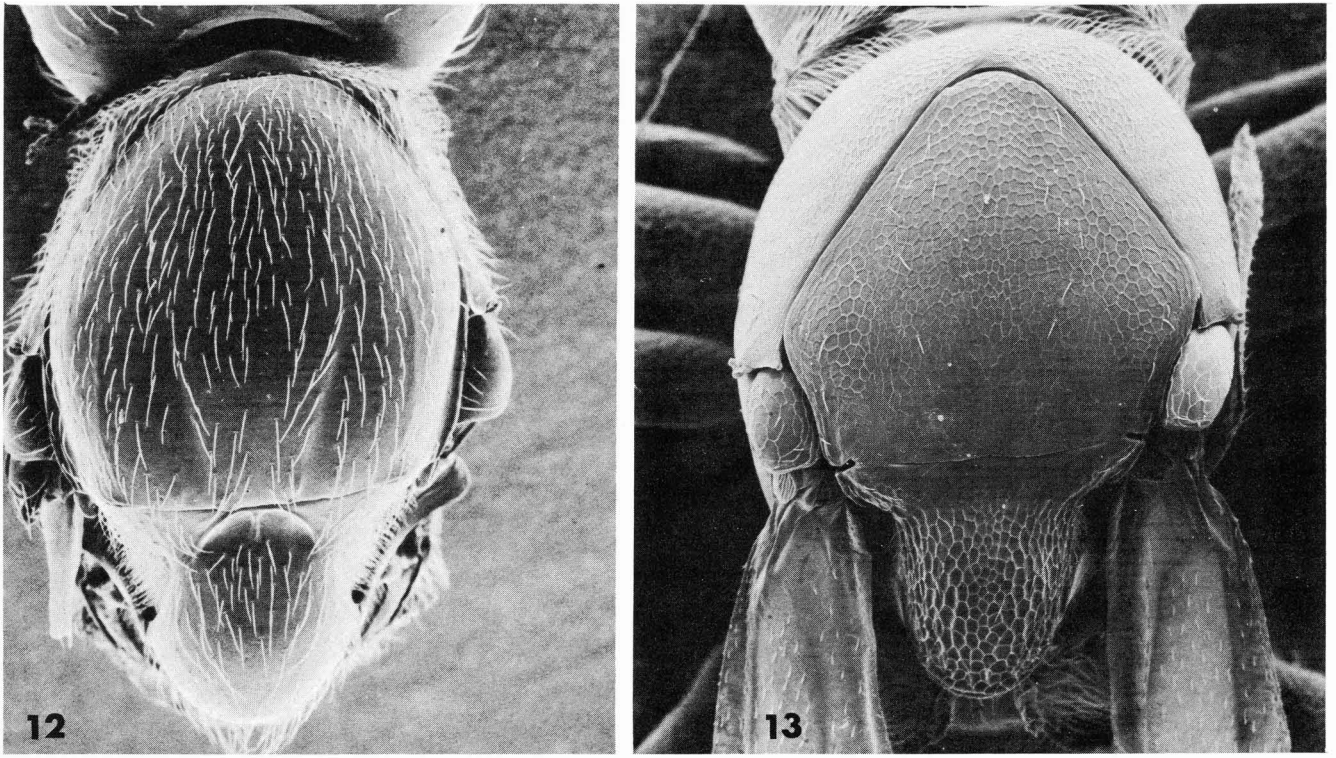
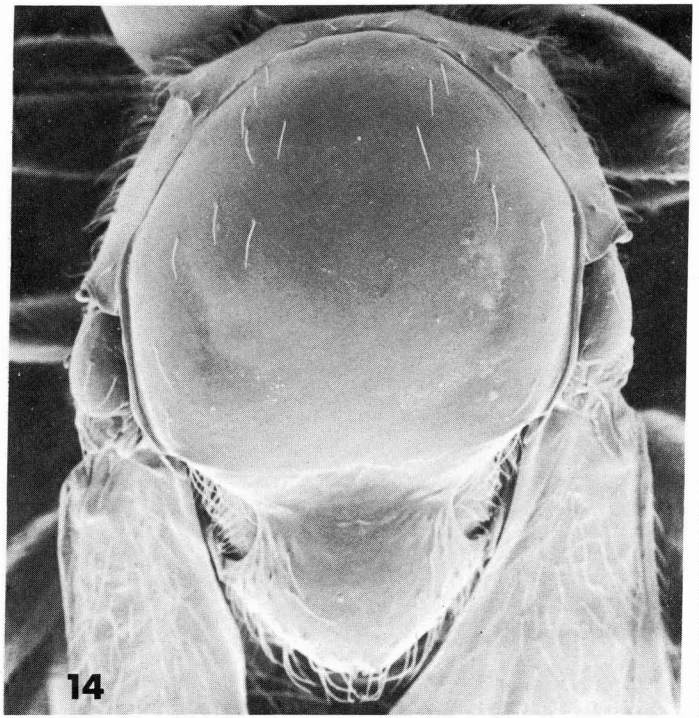


Figures 10–11. Thorax, dorsal view. Fig. 10. *Phaenoglyphis americana* Baker. Fig. 11. *Phaenoglyphis ambrosiae* (Ashmead).



Figures 12–13. Thorax, dorsal view. Fig. 12. *Hemicrisis ruficornis* Foerster. Fig. 13. *Lytoxysta brevipalpis* Kieffer.



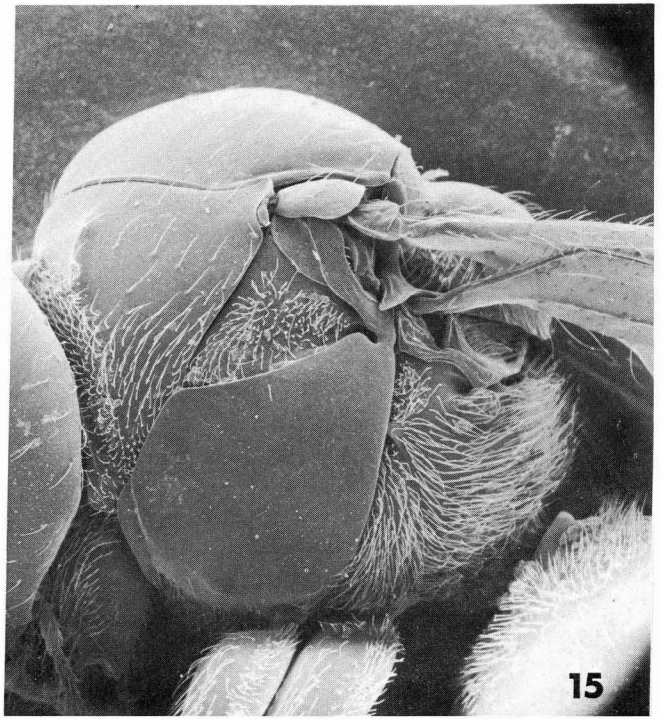
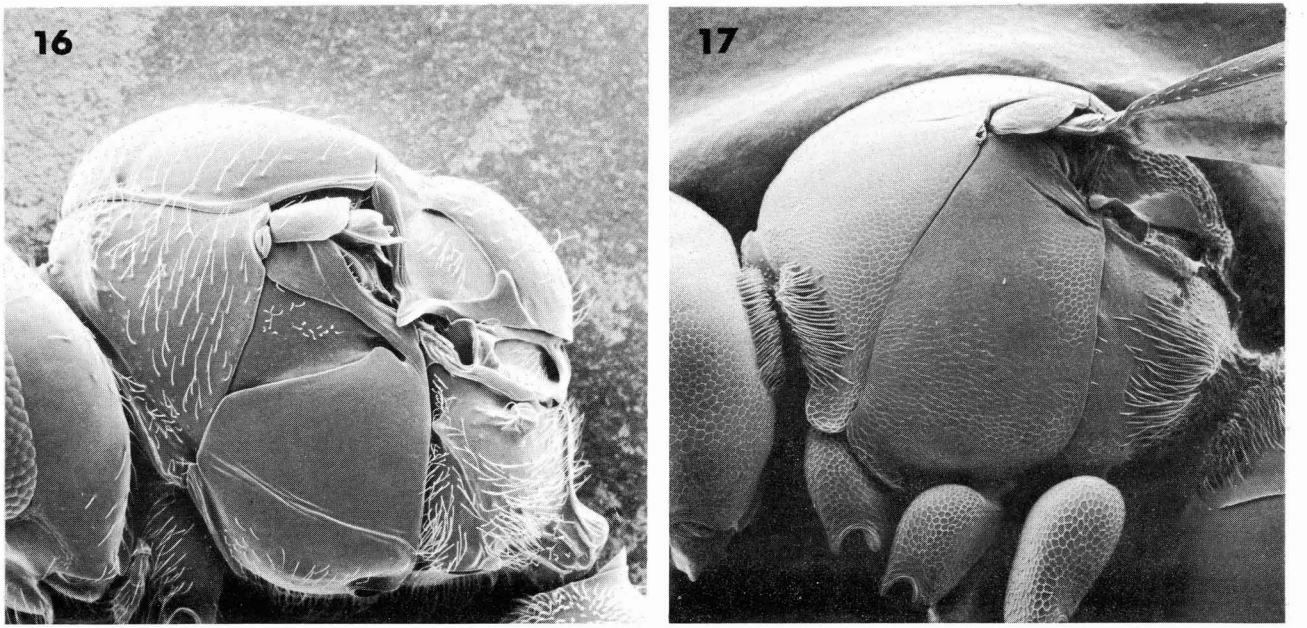


Figure 14. Thorax, dorsal view. *Alloxysta xanthopsis* (Ashmead). Figure 15. Mesopleuron, *Alloxysta victrix* (Westwood)



Figures 16–17. Mesopleuron. Fig. 16. *Phaenoglyphis ambrosiae* (Ashmead) Fig. 17. *Lytoxysta brevipalpis* Kieffer.

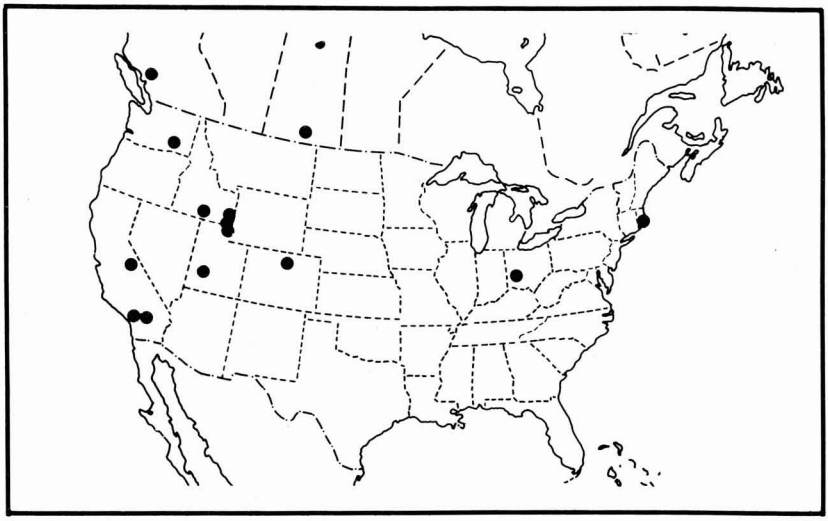


Figure 18. Known geographical distribution of *Lytoxysta brevipalpis* Kieffer.

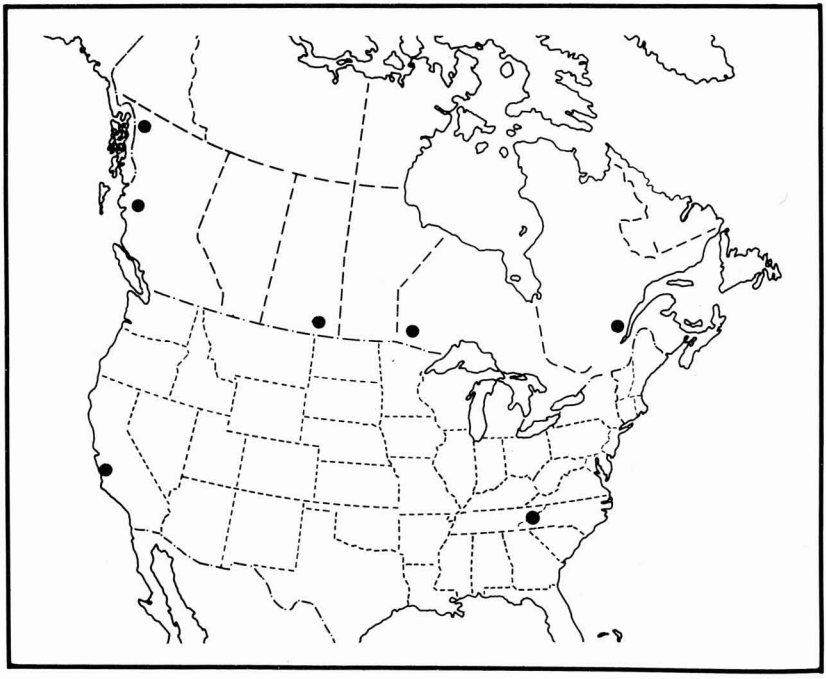


Figure 19. Known geographical distribution of *Hemicrisis ruficornis* Foerster.

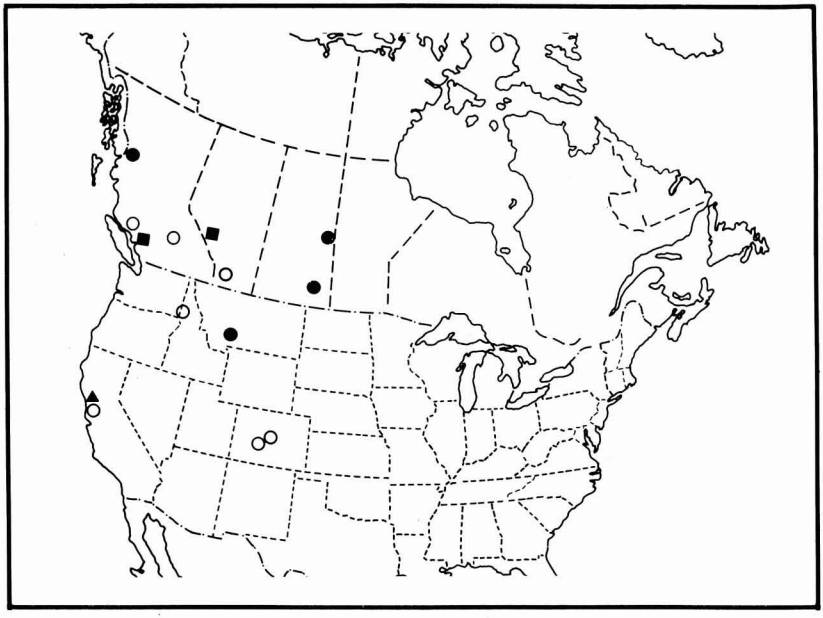


Figure 20. Known geographical distribution of *Phaenoglyphis pilosus* Andrews (○), *P. laevis* Andrews (■), *P. calverti* (▲), and *P. gutierrezi* Andrews (●).

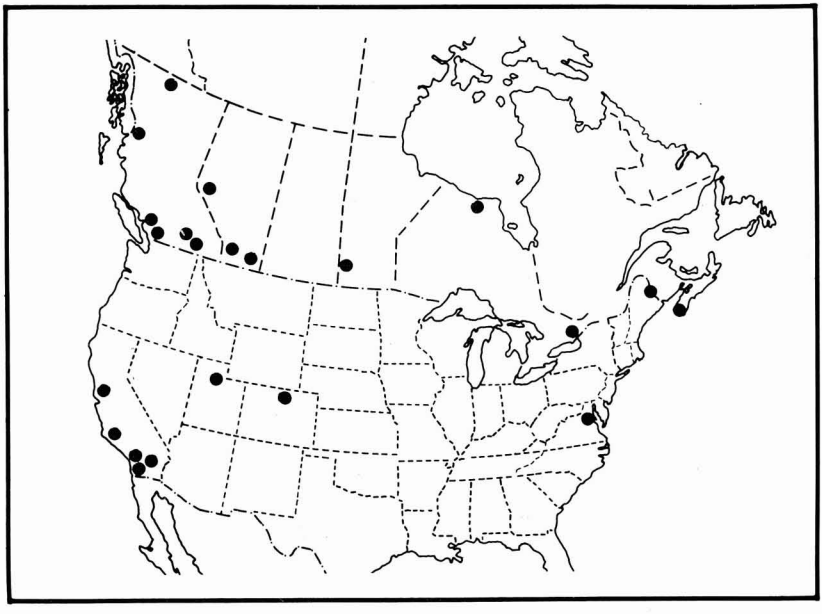


Figure 21. Known geographical distribution of *Phaenoglyphis americana* Baker.

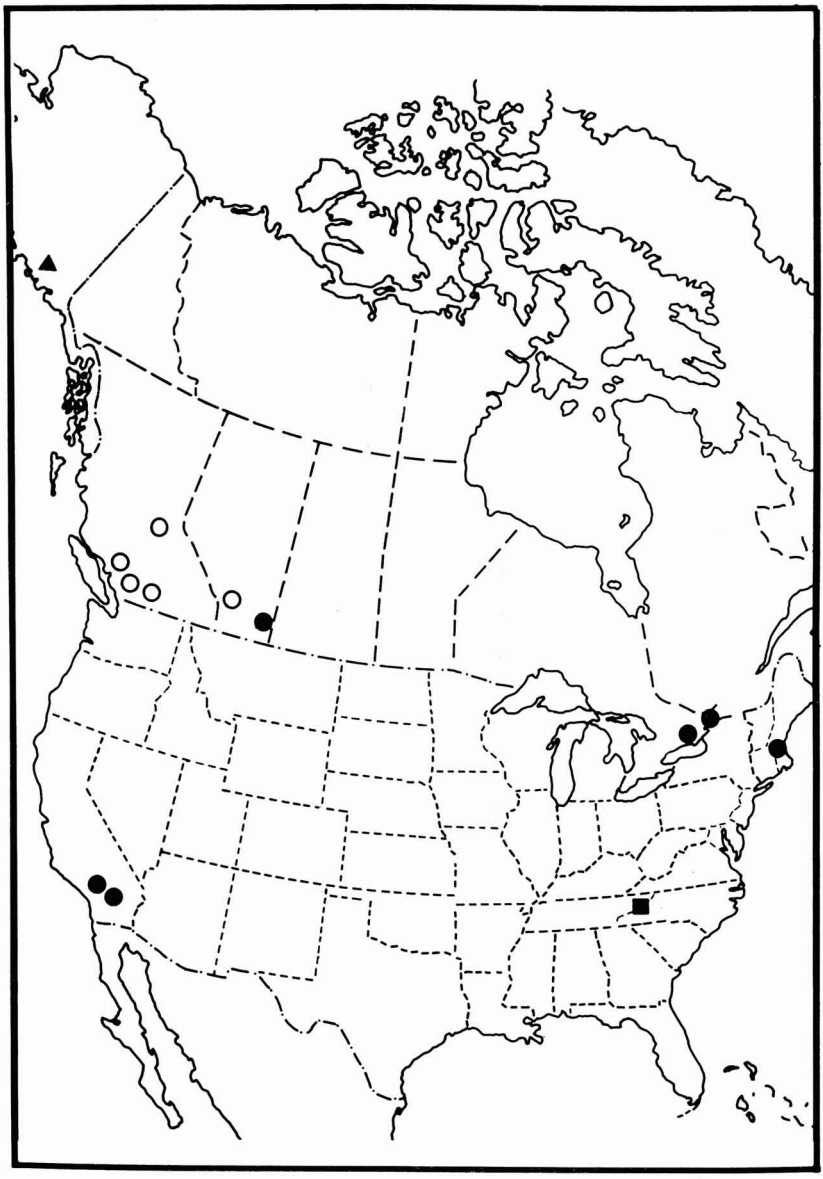


Figure 22. Known geographical distribution of *Phaenoglyphis pecki* Andrews (■), *P. ambrosiae* (Ashmead) (●), *P. falcata* Andrews (○), and *P. stenos Andrews* (▲).

Figure 23. Known geographical distribution of *Alloxysta commensuratus* Andrews (■), *A. filimentosus* Andrews (○), *A. minuscula* Andrews (●), a and *A. xanthopsis* (Ashmead) (▲).

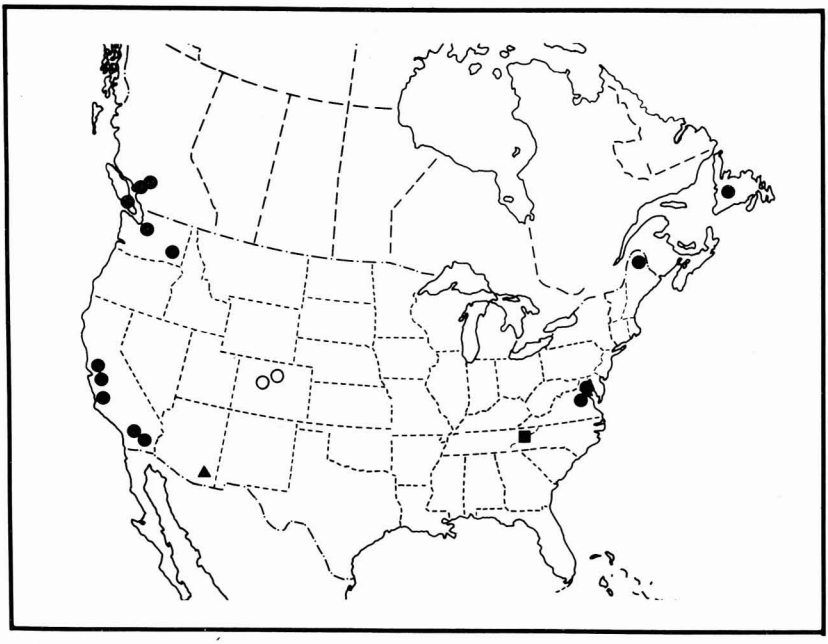


Figure 24. Known geographical distribution of *Alloxysta victrix* (Westwood) (●), *A. affinis* (Baker) (○), *A. coniferensis* Andrews (■), and *A. schlingeri* Andrews (▲).

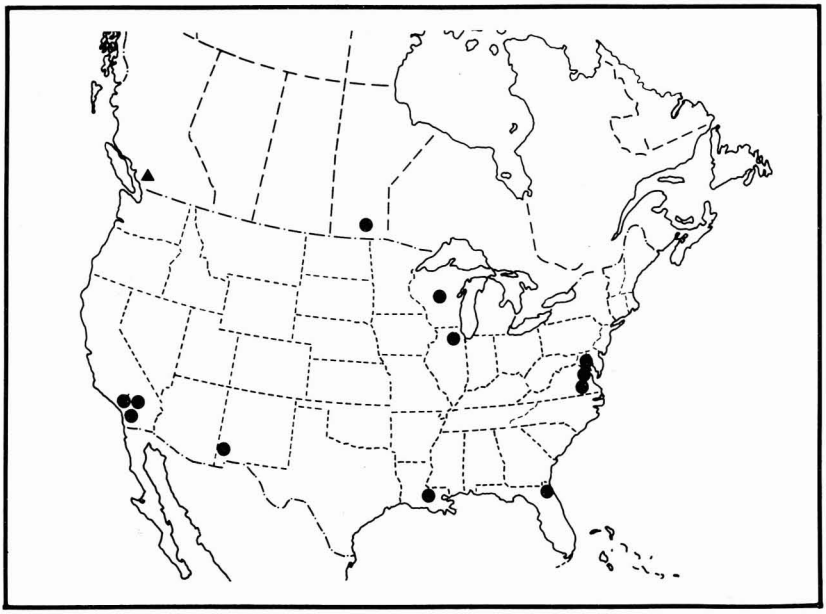


Figure 25. Known geographical distribution of *Alloxysta brassicae* (Ashmead) (●), and *A. rauchi* Andrews (▲).

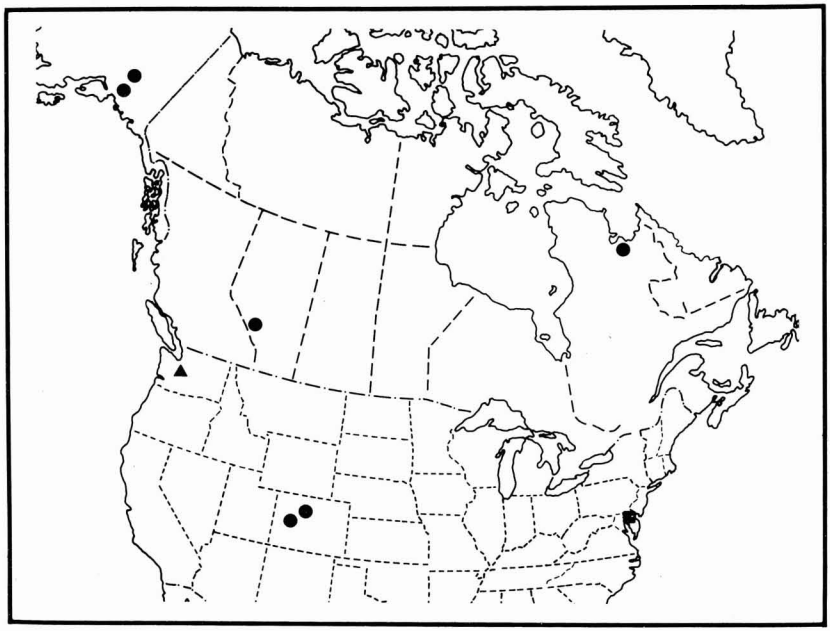


Figure 26. Known geographical distribution of *Alloxysta anthracina* Andrews (●), *A. halli* Andrews (▲), and *A. dicksoni* Andrews (■).

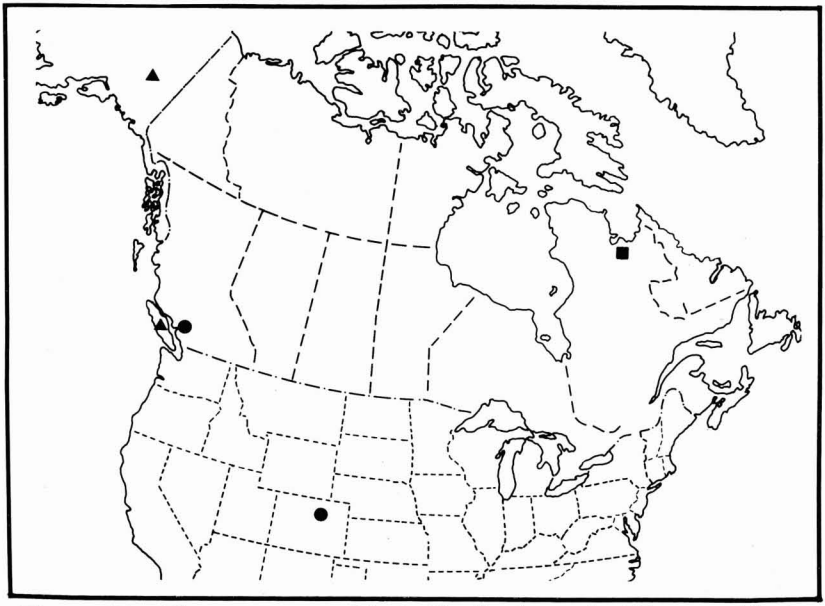


Figure 27. Known geographical distribution of *Alloxysta bicolor* (Baker) (●), *A. quebeci* Andrews (■), and *A. vandenboschi* Andrews (▲).

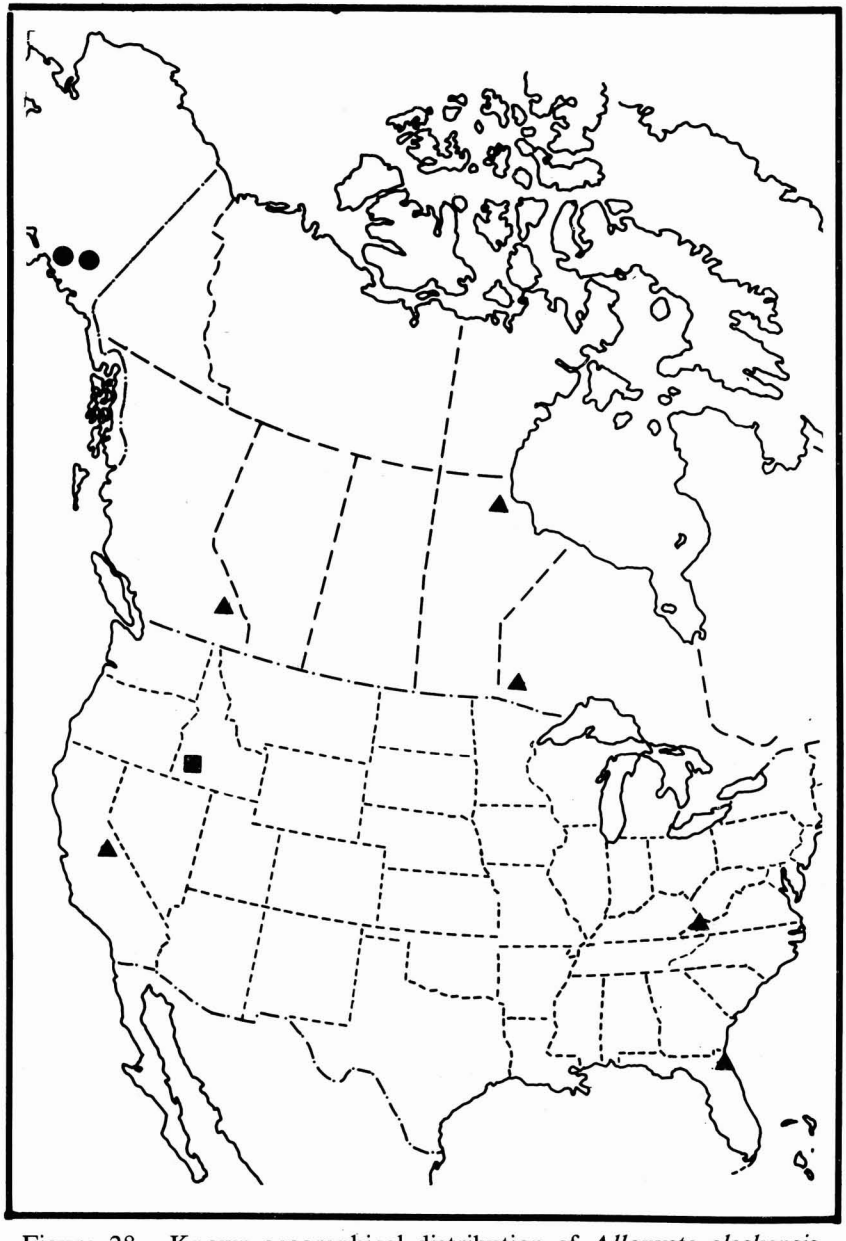
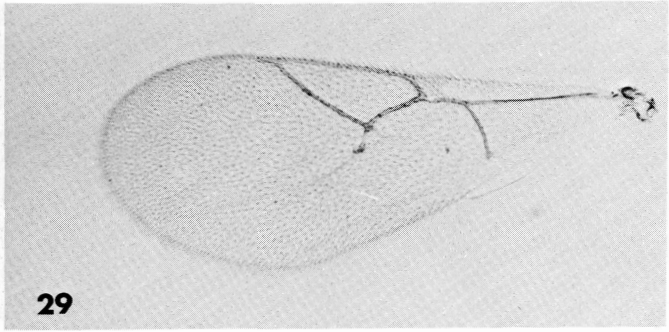
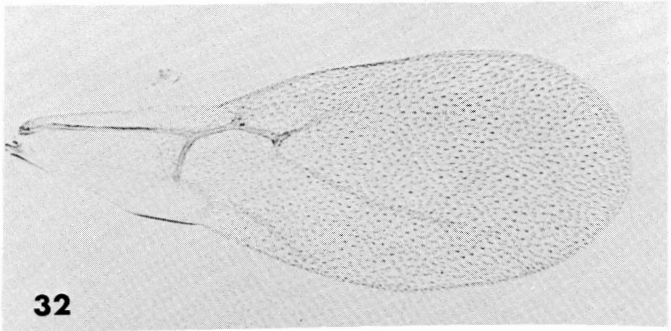
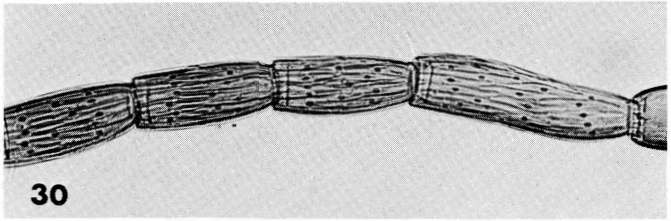
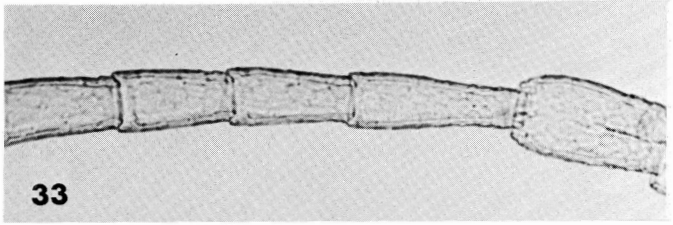


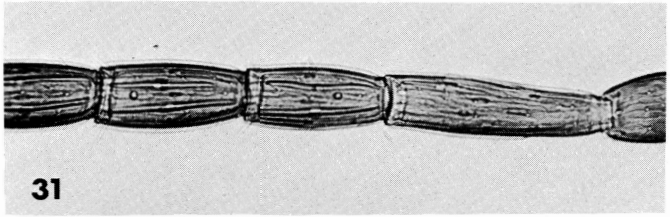
Figure 28. Known geographical distribution of *Alloxysta alaskensis* Andrews (●), *A. lachni* (Ashmead) (▲), and *A. leguminosa* (Weld) (■).

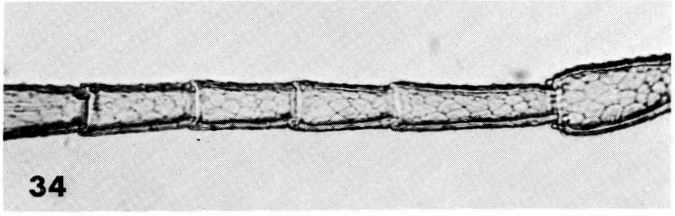






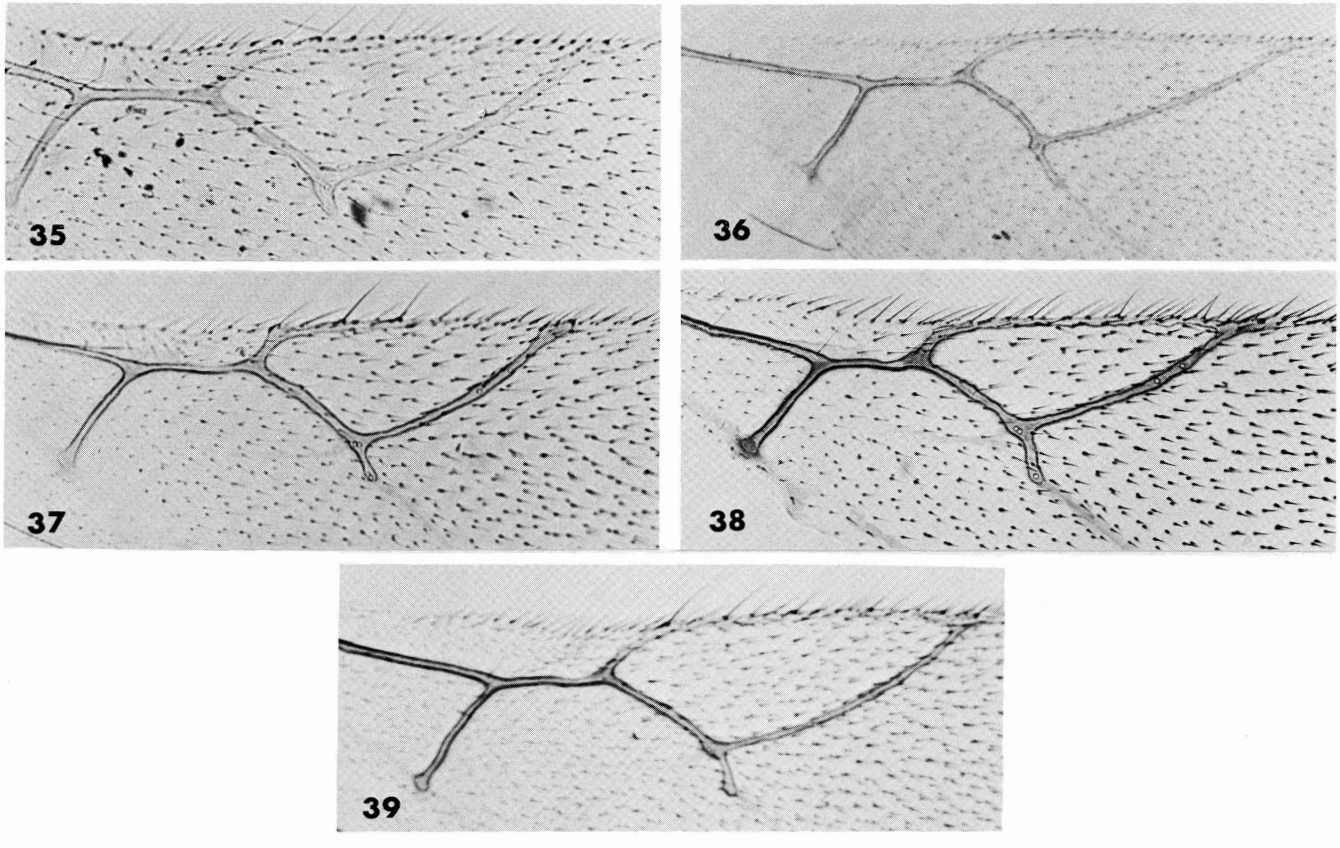




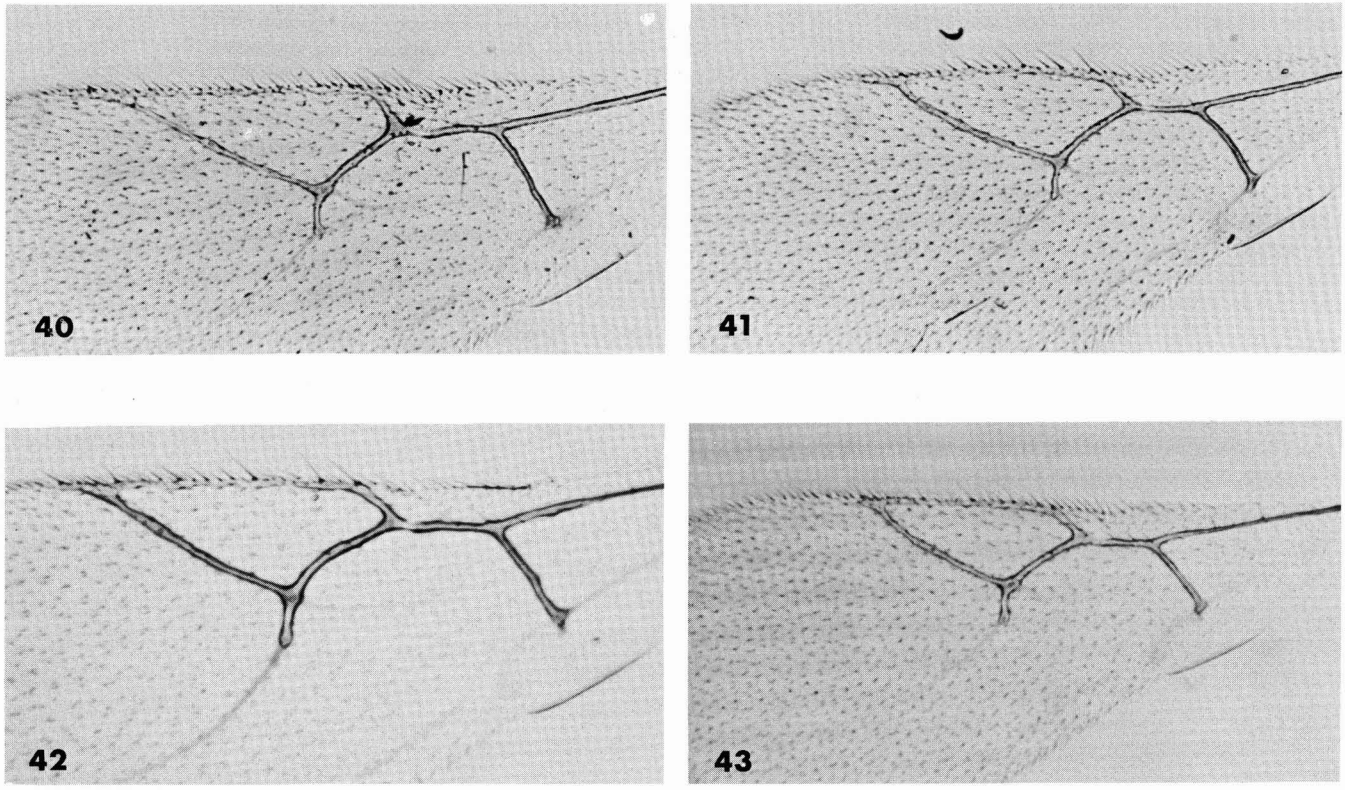


Figures 29–31. *Hemicrisis ruficornis* Foerster. Fig. 29. Forewing. Fig. 30. Antennal segments 3–5, male. Fig. 31. Antennal segments 3–5, female.

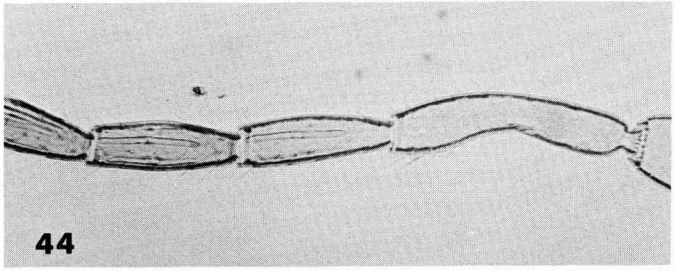
Figures 32–34. *Lytoxysta brevipalpis* Kieffer. Fig. 32. Forewing. Fig. 33. Antennal segments 3–5, male. Fig. 34. Antennal segments 3–5, female.

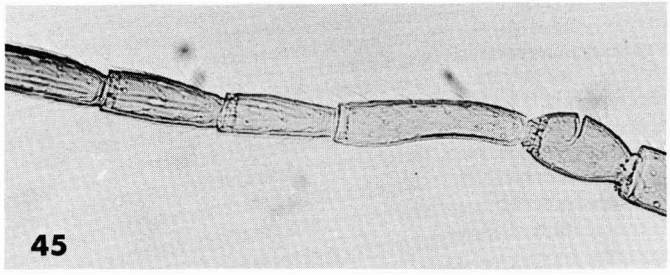


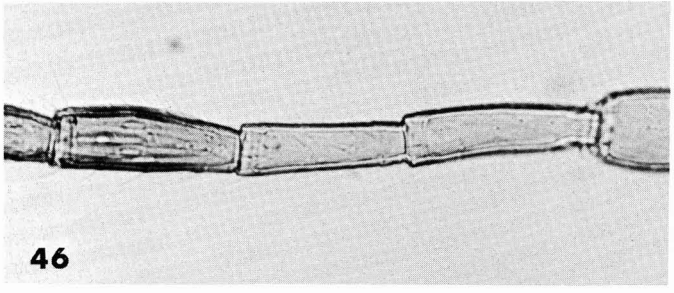
Figures 35–39. Radial cell. Phaenoglyphis spp. Fig. 35. *P. pecki* Andrews. Fig. 36. *P. pilosus* Andrews. Fig. 37. *P. ambrosiae* (Ashmead). Fig. 38. *P. calverti* Andrews. Fig. 39. *P. falcata* Andrews.

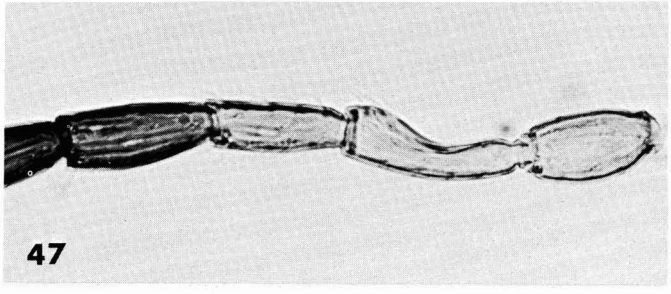


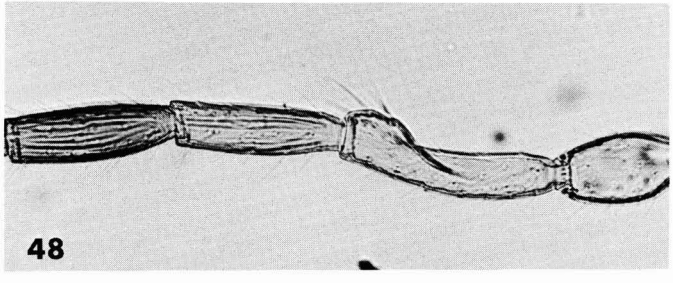
Figures 40–43. Radial cell. *Phaenoglyphis* spp. Fig. 40. P. *stenos* Andrews Fig. 41. P. *laevis* Andrews. Fig. 42. P. *americana* Baker. Fig. 43. P. *gutierrezi* Andrews.



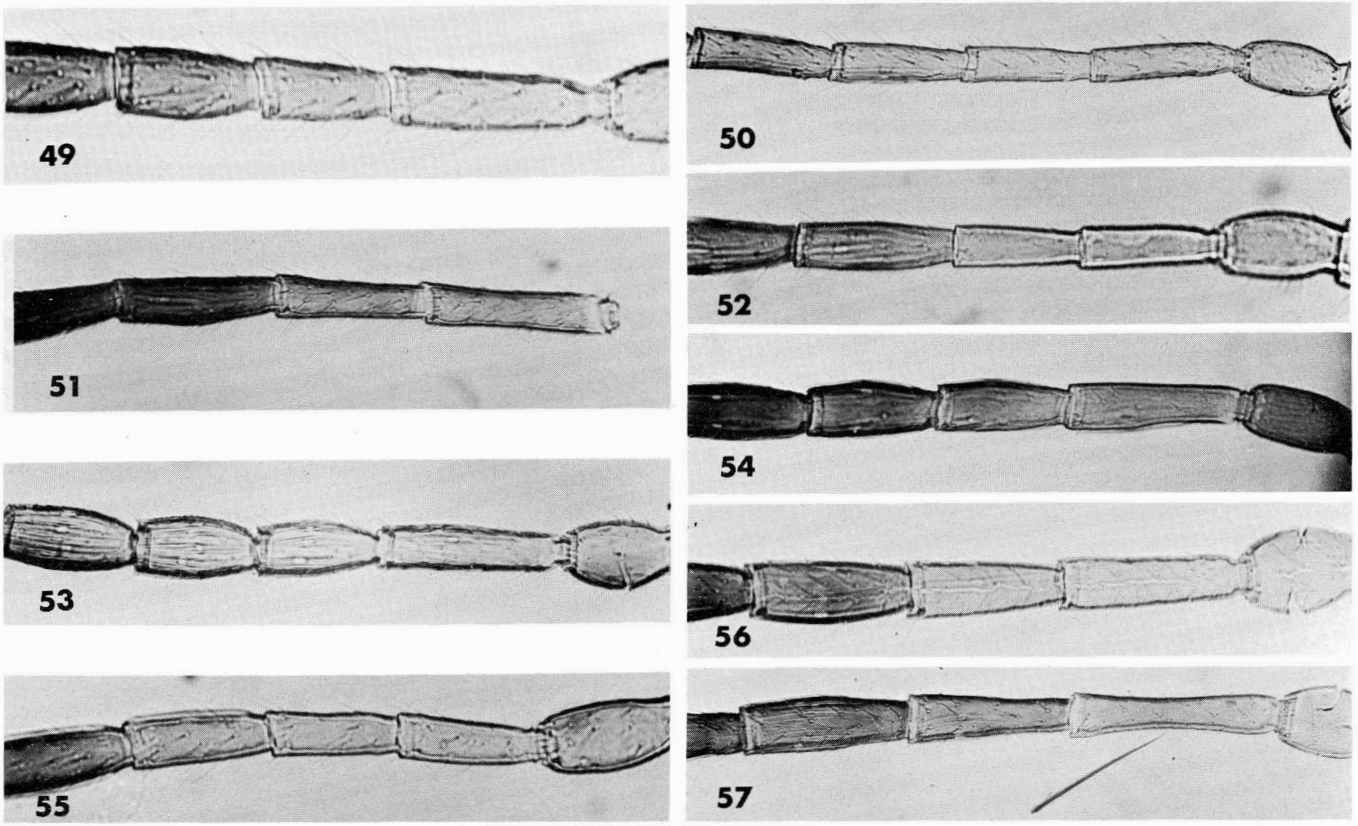




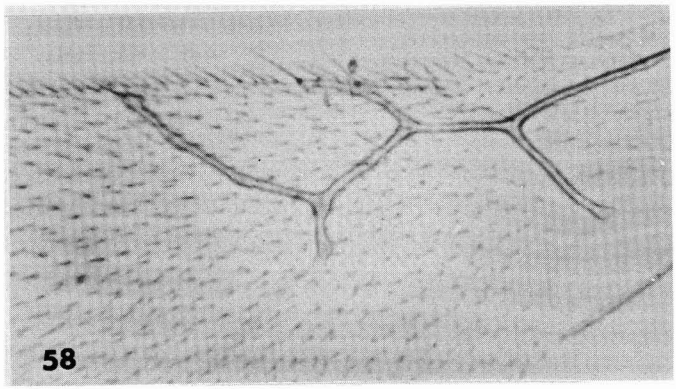


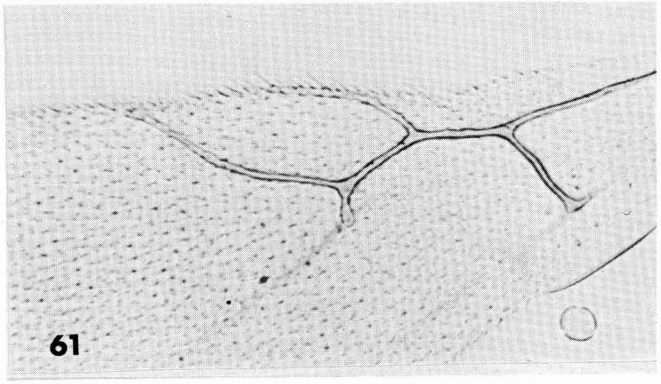


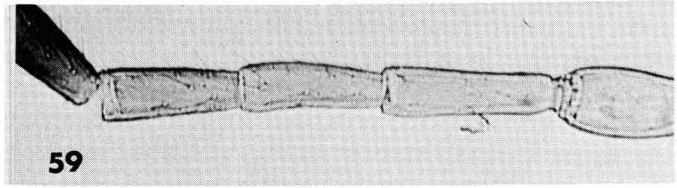
Figures 44–48. Antennal segments 3–5 male. *Phaenoglyphis* spp. Fig. 44. P. *pilosus* Andrews. Fig. 45. P. *americana* Baker. Fig. 46. P. *ambrosiae* (Ashmead). Fig. 47. P. *calverti* Andrews. Fig. 48. P. *falcata* Andrews.

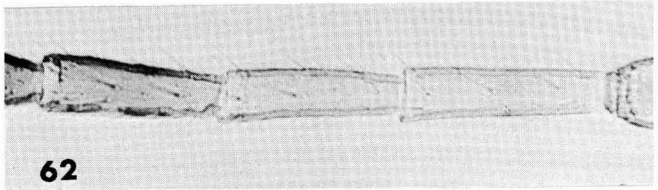


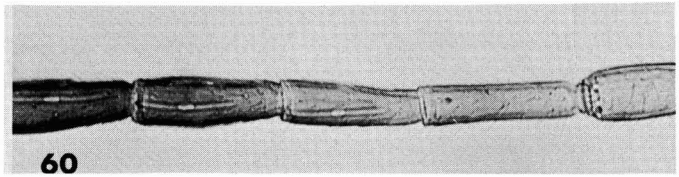
Figures 49–57. Antennal segments 3–5, female. *Phaenoglyphis* spp. Fig. 49. P. *gutierrezi* Andrews. Fig. 50. P. *laevis* Andrews. Fig. 51. P. *calverti* Andrews. Fig. 52. P. *pecki* Andrews. Fig. 53. P. *stenos* Andrews. Fig. 54. P. *americana* Baker. Fig. 55. P. *ambrosiae* (Ashmead). Fig. 56. P. *falcata* Andrews. Fig. 57. P. *pilosus* Andrews.

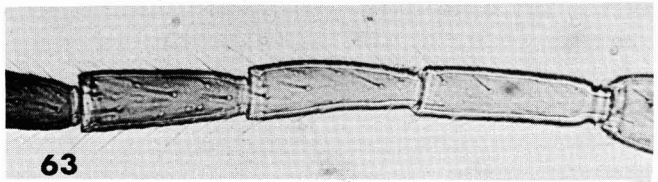






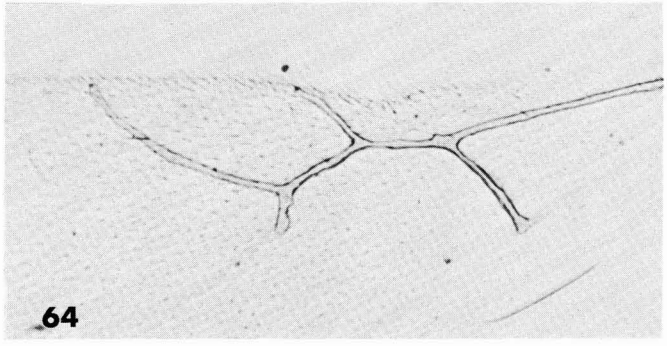


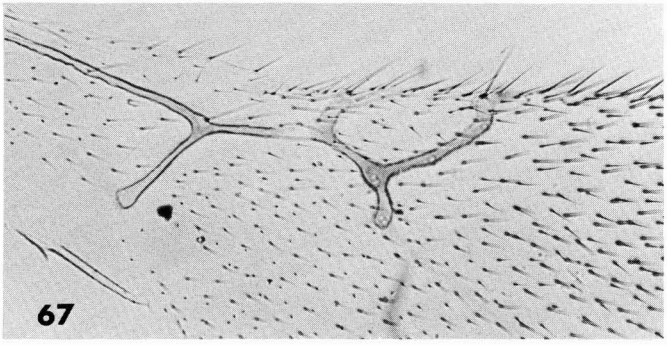


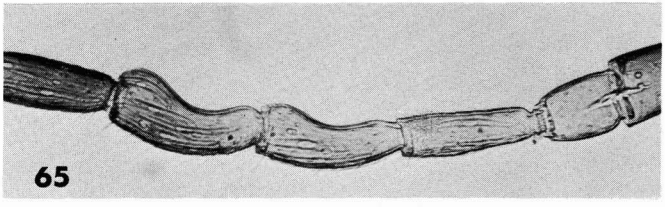


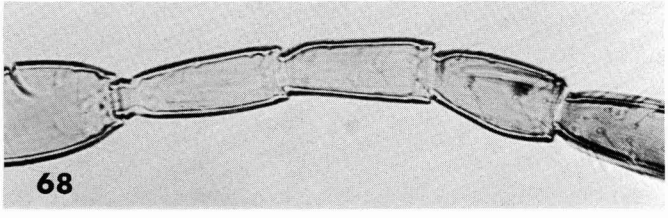
Figures 58–60. *Alloxysta affinis* (Baker). Fig. 58. Radial cell. Fig. 59. Antennal segments 3–5, male. Fig. 60. Antennal segments 3–5, female.

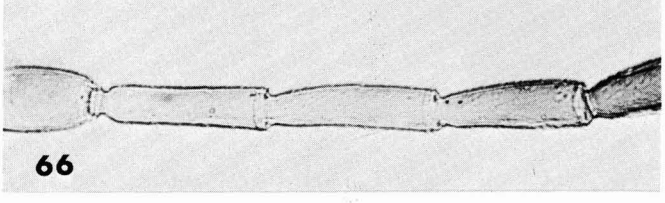
Figures 61–63. *Alloxysta bicolor* (Baker). Fig. 61. Radial cell. Fig. 62. Antennal segments 3–5, male. Fig. 63. Antennal segments 3–5, female.

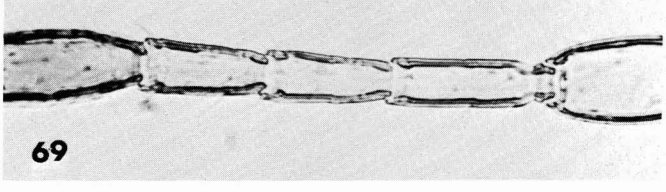






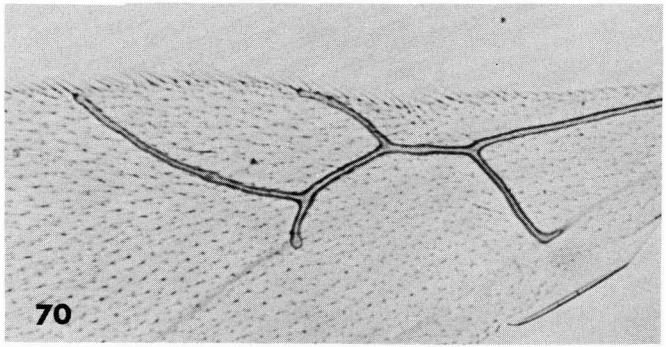


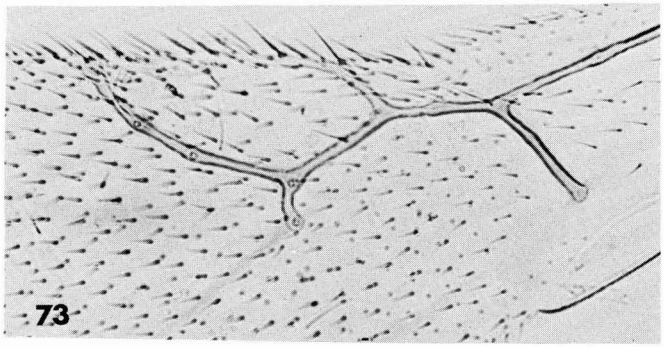


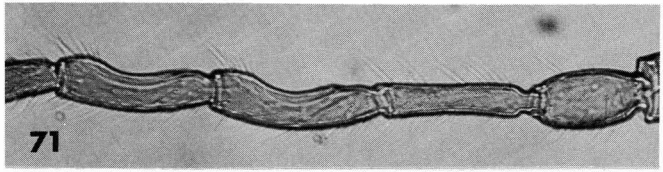


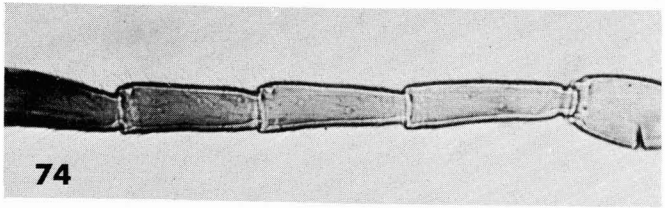
Figures 64–66. *Alloxysta alaskensis* Ashmead. Fig. 64. Radial cell. Fig. 65. Antennal segments 3–5, male. Fig. 66. Antennal segments 3–5, female.

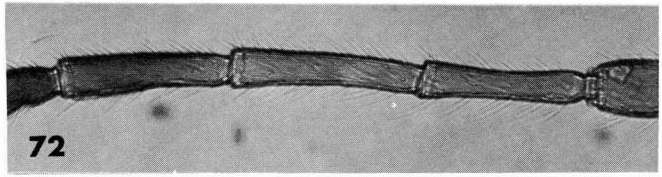
Figures 67–69. *Alloxysta schlingeri* Andrews. Fig. 67. Radial cell. Fig. 68. Antennal segments 3–5, male. Fig. 69. Antennal segments 3–5, female.

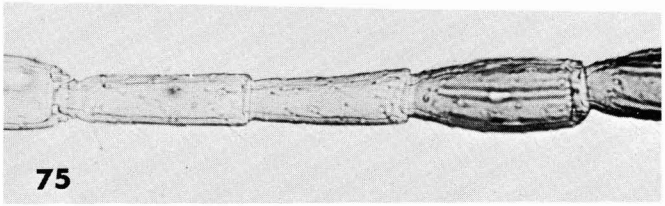






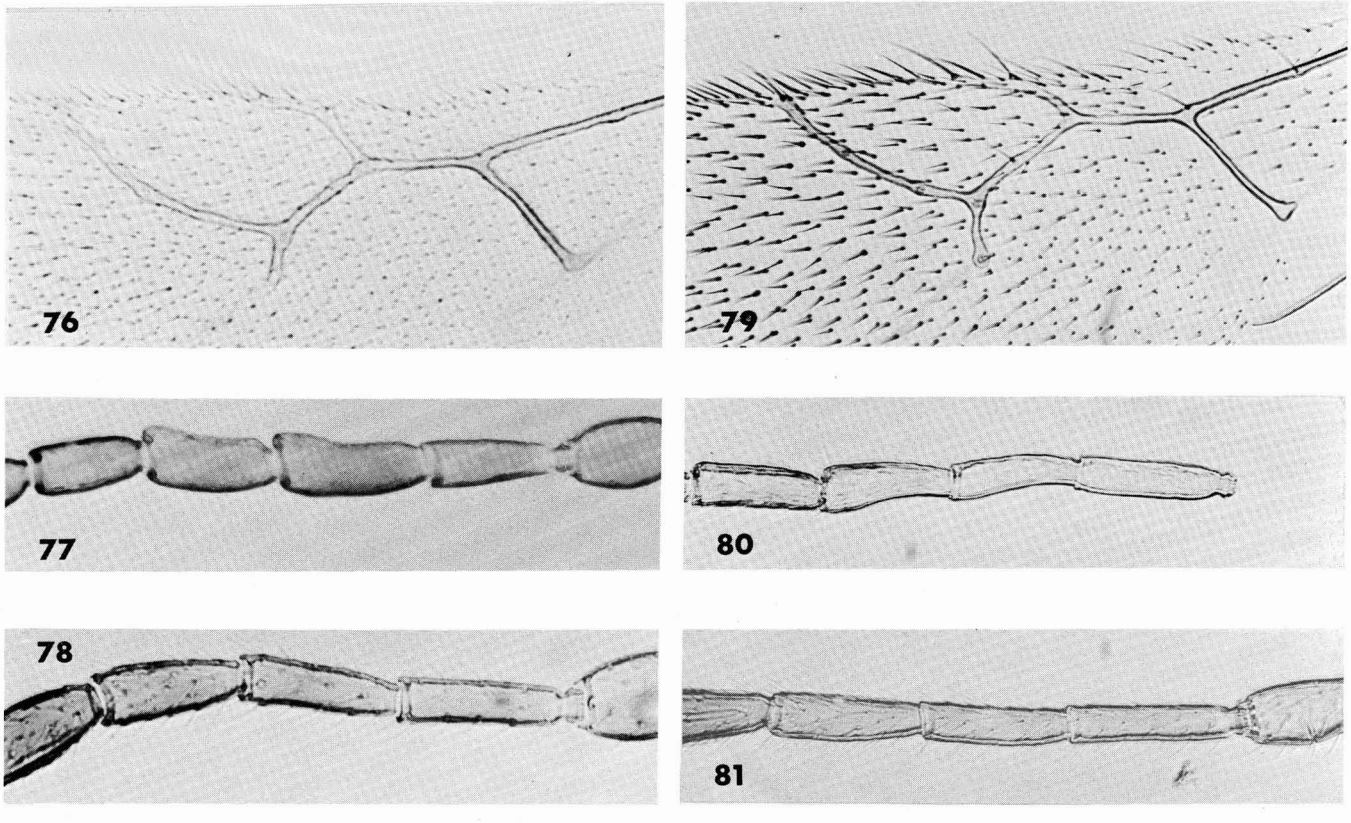






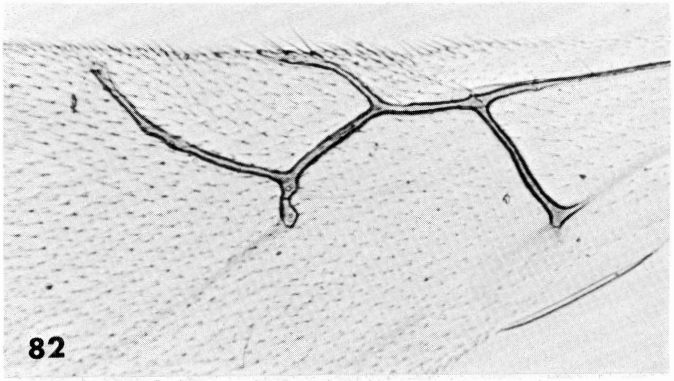
Figures 70–72. *Alloxysta coniferensis* Andrews. Fig. 70. Radial cell. Fig. 71. Antennal segments 3–5, male. Fig. 72. Antennal segments 3–5, female.

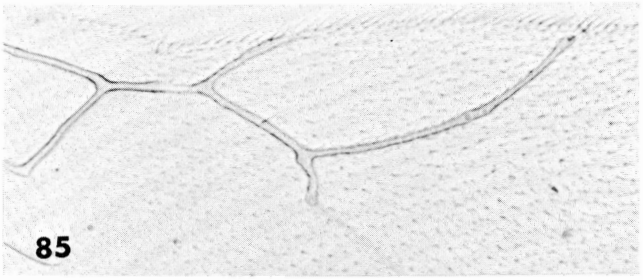
Figures 73–75. *Alloxysta commensuratus* Andrews. Fig. 73. Radial cell. Fig. 74. Antennal segments 3–5, male. Fig. 75. Antennal segments 3–5, male. Fig. 72. Antennal segments. 3–5 female.

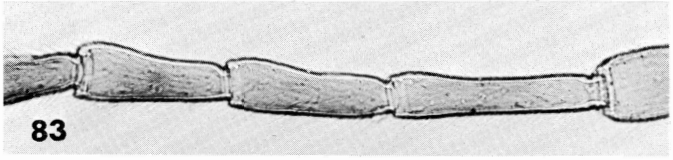


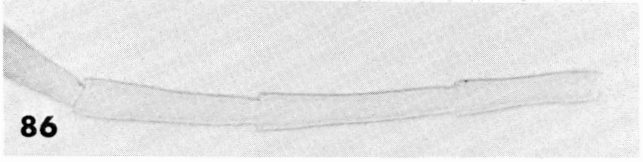
Figures 76–78. *Alloxysta minuscula* Andrews. Fig. 76. Radial cell. Fig. 77. Antennal segments 3–5, male. Fig. 78. Antennal segments 3–5, female.

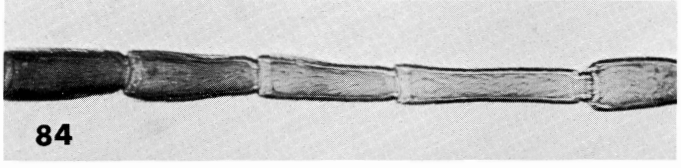
Figures 79–81. *Alloxysta halli* Andrews. Fig. 79. Radial cell. Fig. 80. Antennal segments 3–5, male. Fig. 81. Antennal segments 3–5, female.





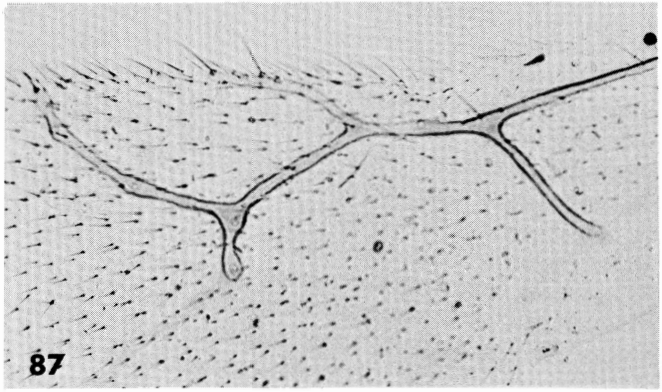


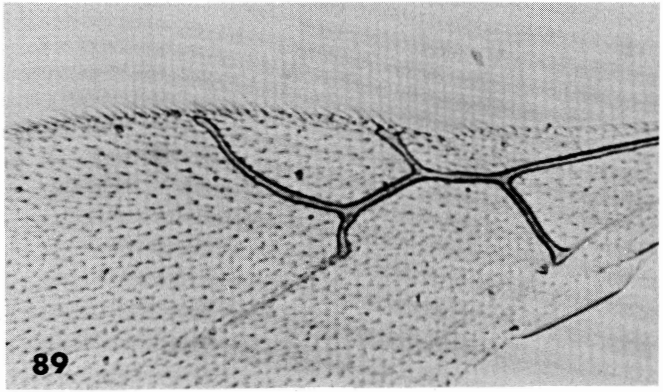


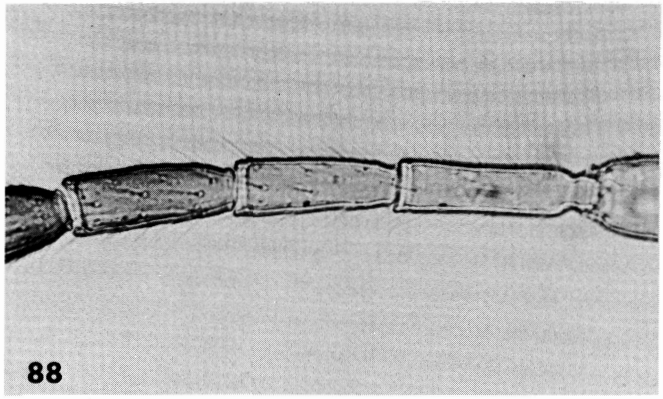


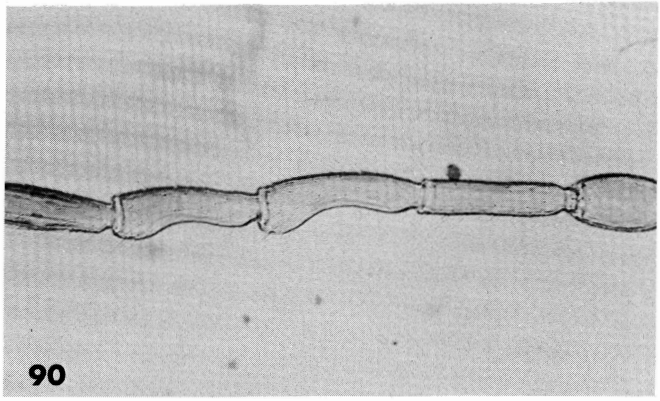
Figures 82–84. *Alloxysta anthracina* Andrews. Fig. 82. Radial cell. Fig. 83. Antennal segments 3–5, male. Fig. 84. Antennal segments 3–5, female.

Figures 85–86. *Alloxysta filimentosus* Andrews. Fig. 85. Radial cell. Fig. 86. Antennal segments 3–5, female.



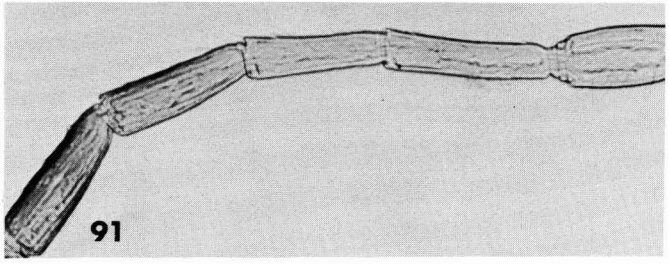


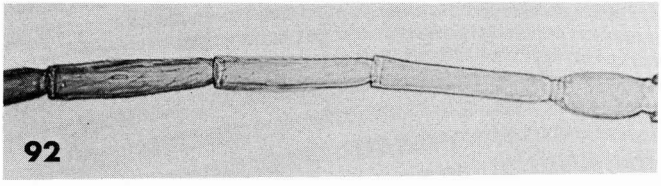


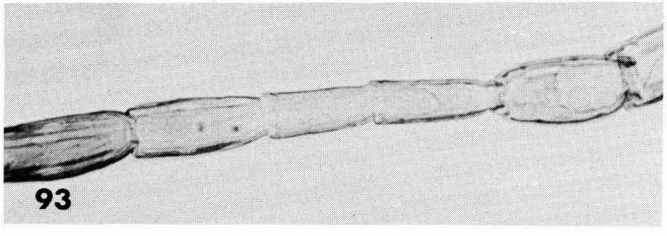


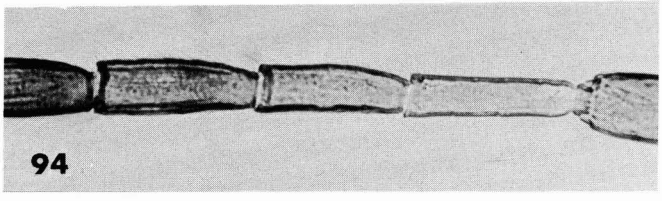
Figures 87–88. *Alloxysta quebeci* Andrews. Fig. 87. Radial cell. Fig. 88. Antennal segments 3–5, female.

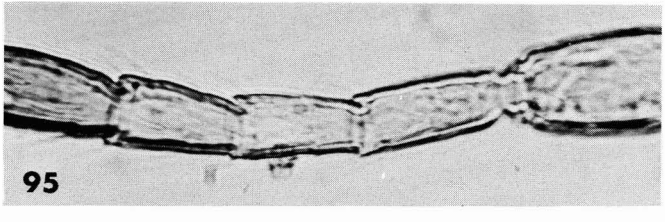
Figures 89–90. *Alloxysta vandenboschi* Andrews. Fig. 89. Radial cell. Fig. 90. Antennal segments 3–5, male.

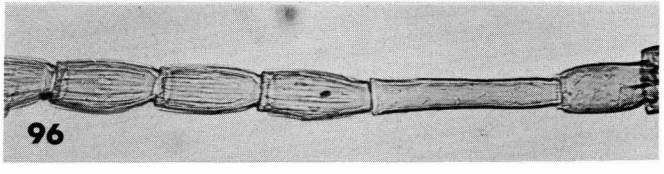


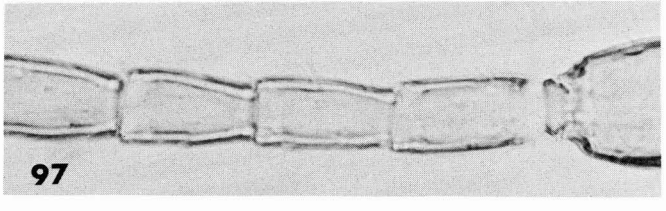




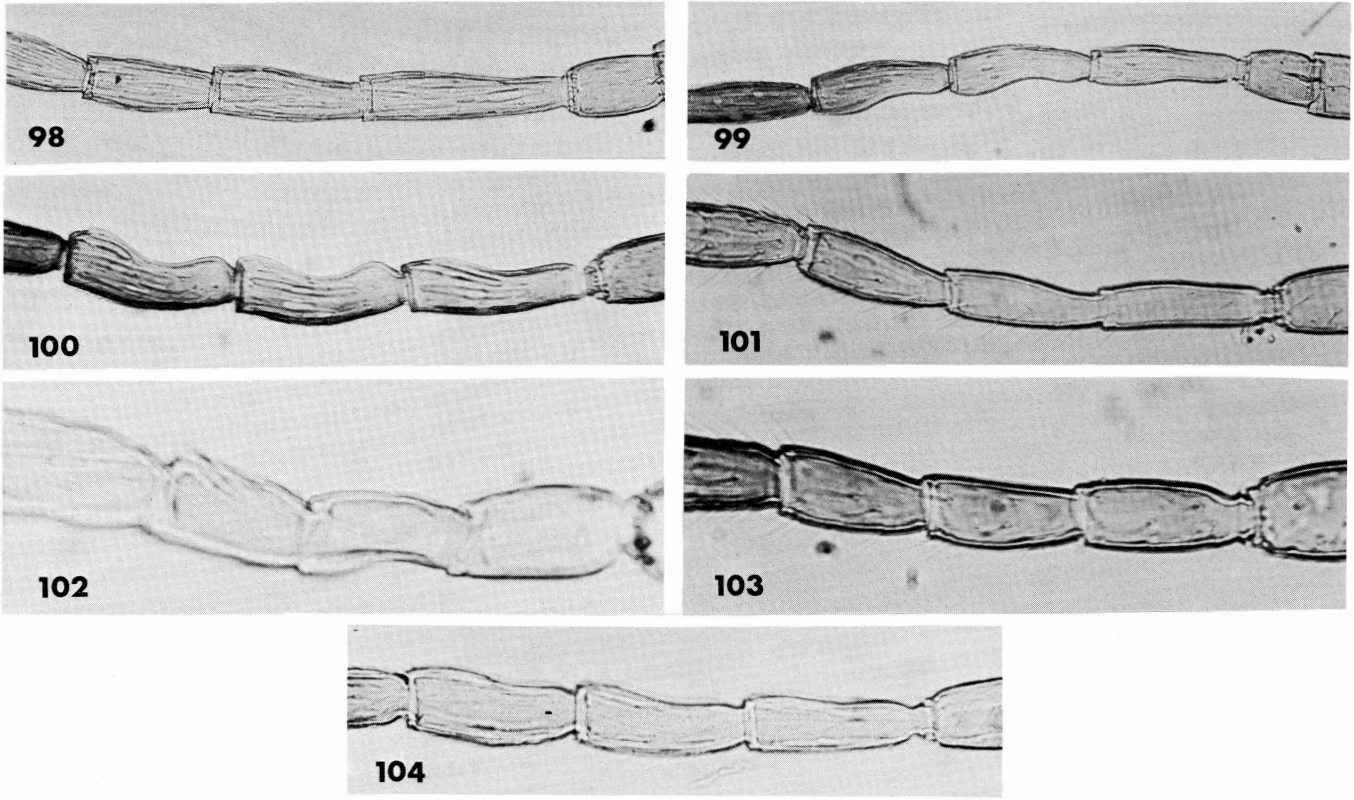




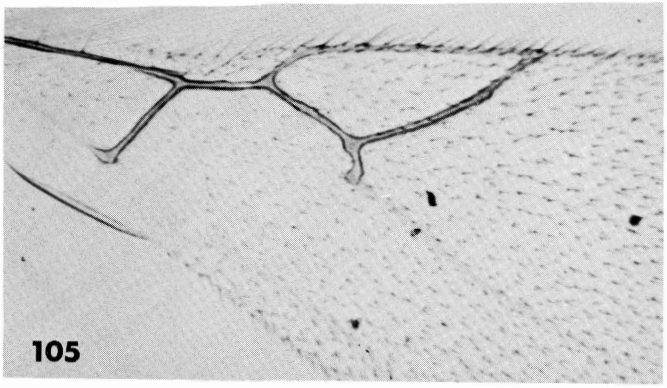


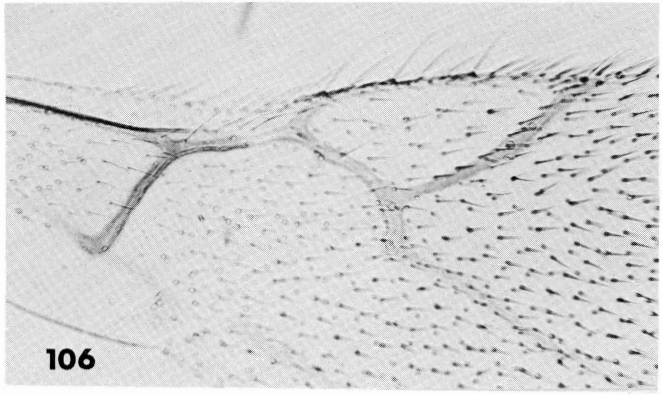


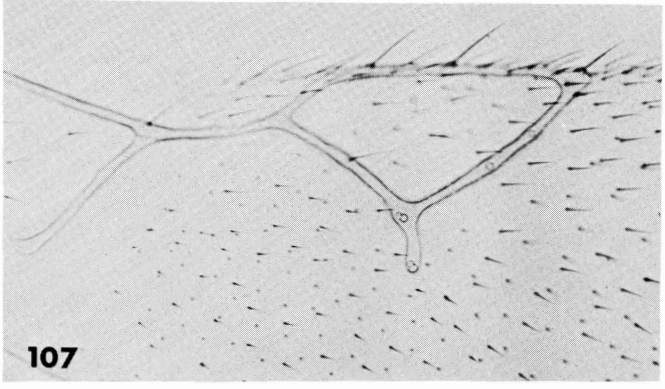
Figures 91–97. Antennal segments 3–5, female. *Alloxysta* species with closed radial cell. Fig. 91. *A. dicksoni* Andrews. Fig. 92. *Alloxysta victrix* (Westwood). Fig. 93. *Alloxysta xanthopsis* (Ashmead). Fig. 94. *Alloxysta brassicae* (Ashmead). Fig. 95. *Alloxysta leguminosa* (Weld). Fig. 96. *A. lachni* (Ashmead). Fig. 97. *Alloxysta rauchi* Andrews.

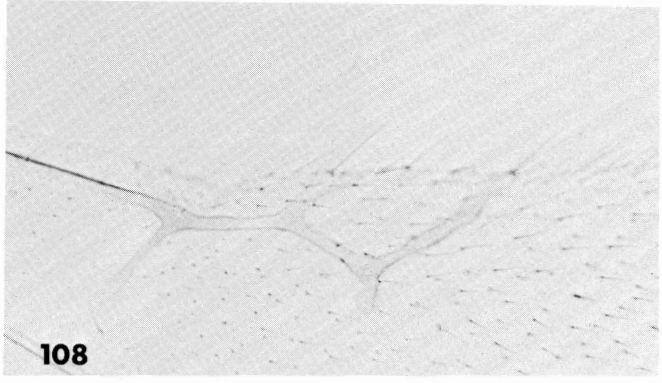


Figures 98–104. Antennal segments 3–5, male. *Alloxysta* species with closed radial cell. Fig. 98. *A. lachni* (Ashmead). Fig. 99. *A. victrix* (Westwood). Fig. 100. *A. brassicae* (Ashmead). Fig. 101. *A. dicksoni* Andrews. Fig. 102. *A. rauchi* Andrews. Fig. 103. *A. leguminosa* (Weld). Fig. 104. *A. xanthopsis* (Ashmead).

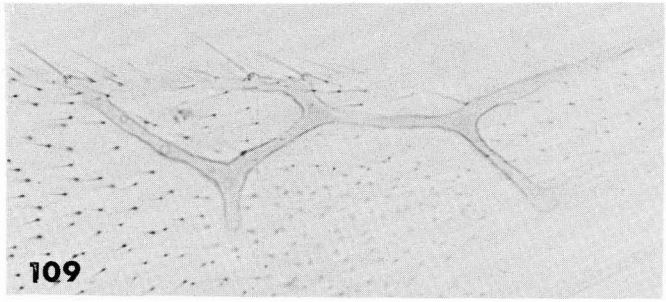


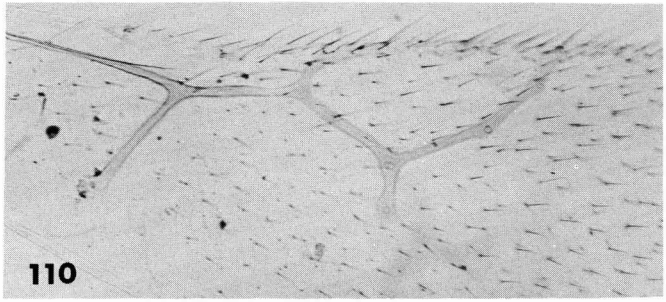


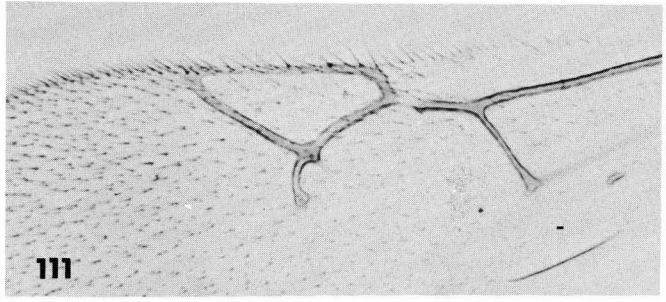


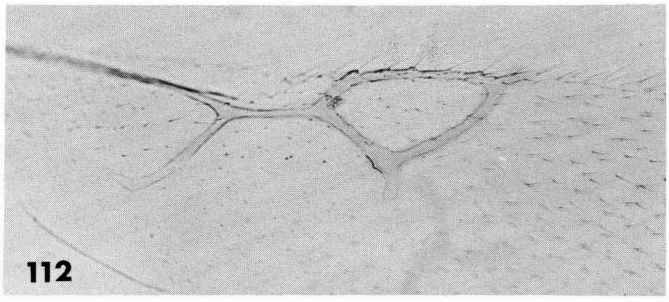


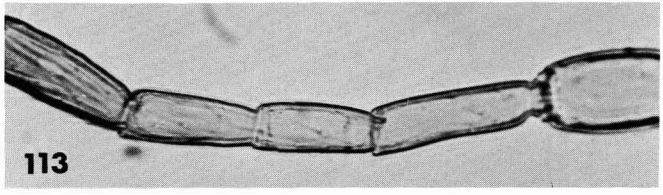
Figures 105–108. Radial cell. *Alloxysta* species with closed radial cell. Female. Fig. 105. *A. victrix* (Westwood). Fig. 106 *A. brassicae* (Ashmead). Fig. 107. *A. xanthopsis* (Ashmead). Fig. 108. *A. rauchi* Andrews.

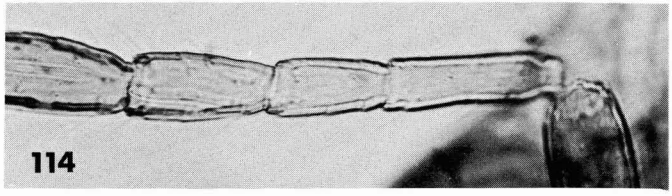




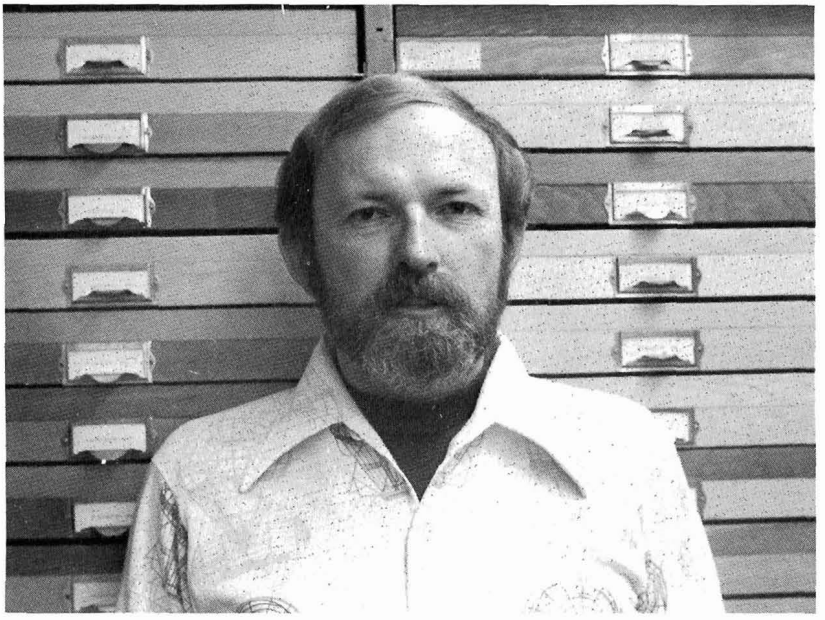








Figures 109–112. Radial cell. *Alloxysta* species with closed radial cell. Fig. 109. *A. leguminosa* (Weld). Fig. 110. *A. dickseni* Andrews. Fig. 111. *A. lachni* (Ashmead). Fig. 112. "*A. megourae* complex." Figs. 113–114. Antennal segments 3–5, "*A. megourae* complex." Fig. 113. Male. Fig. 114. Female.



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DR. FRED G. ANDREWS

Dr. Fred G. Andrews has been employed by the California Department of Food and Agriculture for the past seven years. His area of specialization is Coleoptera. His research is concerned with the systematics of larval and adult Lathridiidae including studies on host preferences, distribution and life histories. Other interests include the coleoptera associated with sand dunes in the western United States.

Fred is a native Californian, born and raised in Glendale, California. His wife's name is Julie and they have a daughter, Laura, and a son, Daniel. He received his B.A. in Education at California State University at Los Angeles and subsequently taught in the Montebello School District in Southern California. This was followed by graduate work in zoology at California State University, Los Angeles, followed by two years as a technician in the field of medical entomology at the University of California, Riverside. His doctoral work was also at Riverside and was a biosystematic study of the hymenopteros aphid-hyperparasites in the subfamily Alloxystinae. Employment in Sacramento followed graduation. Fred is currently serving as the President of the Pacific Coast Entomological Society.